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DEPARTMENT OF THE INTERIOR—U. S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

# MINERAL PRODUCTS OF THE UNITED STATES

## REVIEW OF CONDITIONS AND OUTPUT IN 1910 AND 1911

By EDWARD W. PARKER

ADVANCE CHAPTER FROM MINERAL RESOURCES OF THE UNITED STATES
CALENDAR YEAR 1911

WASHINGTON
GOVERNMENT PRINTING OFFICE
1912

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# MINERAL RESOURCES OF THE UNITED STATES IN 1911—PART I.

## MINERAL PRODUCTS OF THE UNITED STATES: REVIEW OF CONDITIONS AND OUTPUT IN 1910 AND 1911.

By Edward W. Parker.

### CHARACTER AND SCOPE OF THE REPORT.

The arrangement and scope of the statistical data contained in this report are practically the same as in the twenty-seven preceding reports of the series Mineral Resources of the United States. Each report records the development of the mineral industries of the United States since the time covered by the preceding number of the series; the reports should therefore be consulted together. Each chapter is a census of the productive features of the industry under discussion. The statistics of the imports and exports of minerals, which form an essential part of the volume, are obtained through the courtesy of the Chief of the Bureau of Statistics, Department of Commerce and Labor.

During recent years the statistical treatment has been complemented by studies of the sources of the mineral production and the application of the products in the useful arts. The volumes have in this way grown into a cyclopedia of information, in fact as in name, on the mineral resources of the United States. An accurate knowledge of nature's storehouses from which future supplies are to be drawn is recognized as of paramount importance. To obtain this knowledge, as well as to record the history of past achievement, is the purpose and aim of the division of mineral resources.

### COOPERATION WITH STATE GEOLOGICAL SURVEYS.

In the preparation of the present report, as of those for 1908 and 1910, the United States Geological Survey has had the active cooperation of most of the State geological surveys. The statistics in such cases have been used jointly by the State and Federal surveys, and the results have been checked before publication. The objects attained by cooperative agreement are four in number:

1. The avoidance of annoyance to the producers in the form of duplicate requests for the same statistical information.
2. The securing of prompter and more complete returns.
3. The enabling of the State geologists to keep in touch with the producers and with new developments in their respective jurisdictions.
4. The avoidance of two divergent sets of statistics covering the same field and each bearing an official stamp, the existence of which is necessarily confusing to a student of the subject and tends to discredit one statement or the other, if not both.

Special acknowledgment is made of the assistance received by the United States Geological Survey from the directors of the State surveys; the cooperative arrangement has been carried out in a harmonious manner and with exceedingly gratifying results.

The officials who cooperated with the United States Geological Survey in 1911 are as follows:

Alabama.....Dr. Eugene A. Smith, State geologist, University.
Georgia.....Dr. S. W. McCallie, State geologist, Atlanta.
Illinois.....Mr. Frank W. De Wolf, director, Urbana.
Iowa.....Mr. George F. Kay, director, Iowa City.
Kansas.....Dr. Erasmus Haworth, State geologist, Lawrence.
Kentucky.....Mr. C. J. Norwood, director, Lexington.
Maryland.....Dr. Wm. B. Clark, State geologist, Baltimore.
Michigan.....Mr. R. C. Allen, director, Lansing.
Missouri.....Dr. H. A. Buehler, director, Rolla.
New Jersey.....Dr. Henry B. Kümmel, State geologist, Trenton.
North Carolina.....Dr. Joseph Hyde Pratt, State geologist, Chapel Hill.
Oklahoma.....Mr. D. W. Ohern, director, Norman.
Oregon.....Prof. H. M. Parks, director, Corvallis.
Pennsylvania.....Mr. Richard R. Hice, State geologist, Beaver.
Texas.....Dr. Wm. B. Phillips, director, Austin.
Virginia.....Dr. Thomas L. Watson, director, Charlottesville.
Washington.....Mr. Henry Landes, State geologist, Seattle.
Wisconsin.....Mr. W. O. Hotchkiss, State geologist, Madison.

## ORGANIZATION.

The division of mineral resources, under which this series of reports is compiled, has for the last few years been divided into two sections, namely, "metals" exclusive of iron and "nonmetals" including iron ores and pig iron. The section of metals has been under the administrative charge of Waldemar Lindgren and that of nonmetals under Frank B. Van Horn. For the purpose, primarily, of facilitating the work of collecting the statistics of the precious metals and of providing convenient places for consulting the publications of the United States Geological Survey by the mining fraternity of the Western States, offices of this division are maintained in Denver, Colo., Salt Lake City, Utah, and San Francisco, Cal. H. D. McCaskey has general supervision of the western offices. The division of mineral resources works in close cooperation with the division of economic geology, and most of the chapters and subchapters are prepared by geologists specialized in the subjects treated by them. The advantage of having the services of these specialists, familiar with the occurrence, treatment, and uses of the various mineral substances, is well recognized and has added materially to the standard of the reports. The contributions to the present report have been prepared by the following persons:

General:
Edward W. Parker—Review of conditions in 1910 and 1911.
William T. Thom—Summary of mineral production.
In the section of metals:
H. D. McCaskey—General report on gold and silver; gold, silver, copper, lead, and zinc in Eastern States (mine report); general supervision of reports on gold, silver, copper, lead, and zinc in Western States (mine report); metals and metallic ores—summary; quicksilver.
C. E. Siebenthal—General reports on lead, zinc, and cadmium.
B. S. Butler—General report on copper; special report on silver and copper in Michigan.
W. Lindgren—Platinum.
F. L. Hess—Tin; arsenic; antimony; bismuth; selenium; tungsten; vanadium; uranium; nickel; cobalt; titanium; tantalum.

J. P. Dunlop—Silver, copper, lead, and zinc in Central States (mine report); statistics of recovery of secondary metals, published as a press bulletin.
A. H. Brooks—Gold, silver, and copper in Alaska (mine report).
Chas. W. Henderson (in charge of Denver office)—Gold, silver, copper, lead, and zinc in Colorado, New Mexico, South Dakota, Wyoming, and Texas (mine report).
Chas. G. Yale (in charge of San Francisco office)—Gold, silver, copper, lead, and zinc in California and Oregon (mine report).
V. C. Heikes (in charge of Salt Lake City office)—Gold, silver, copper, lead, and zinc in Arizona, Utah, Nevada, and Montana (mine report).
C. N. Gerry—Gold, silver, copper, lead, and zinc in Idaho and Washington (mine report).

In the section of nonmetals:
Edward W. Parker—Coal; coke; briquetting of fuels.
David T. Day—Petroleum; asphalt, bituminous rock, and related bitumens.
David T. Day and B. Hill—Natural gas.
Charles A. Davis—Peat.
Ernest F. Burchard—Stone; iron ore and pig iron; cement; fluorspar and cryolite; gypsum; lime; manganese ore; sand and gravel.
Jefferson Middleton—Clay-working industries; sand-lime brick; feldspar and quartz; fuller's earth.
A. T. Coons—Slate.
J. S. Diller—Asbestos; talc and soapstone.
W. C. Phalen—Abrasive materials; salt and bromine; mineral paints; barytes and strontium; bauxite and aluminum; chromium; potash salts; sulphur and pyrite.
F. B. Van Horn—Phosphate rock.
Douglas B. Sterrett—Gems and precious stones; mica; monazite.
E. S. Bastin—Graphite.
Hoyt S. Gale—Borax; magnesite.
George C. Matson—Mineral waters.
R. B. Dole—Concentration of mineral waters in relation to their therapeutic effects.

Since 1907, when, at his own request, David T. Day was relieved as chief of division, the administration of the division of mineral resources has been under Edward W. Parker, statistician in charge.

## HISTORICAL REVIEW.

In the present report, as in the preceding ones of the series, the treatment of the mineral production is primarily by subjects. For detailed discussion of the occurrence and production by States of each mineral substance the reader should consult the chapters by subjects in the subsequent pages and in Part II of this report. The statistics of production include comparisons with earlier years, the figures for which are carried forward each year for convenient reference. The earlier volumes, beginning with that for 1882, the first of the series, should be consulted for other notes on occurrences, development, trade conditions and uses, descriptions of mining districts, and other information of a technical character which it is impracticable to carry forward from year to year.

In the 30 years covered by the Survey's annual reports on the mineral resources of the United States the value of the mineral production of this country has grown from $451,901,159 in 1882 to $1,918,326,253 in 1911. In 1880, according to the census of that year, the value of the mineral production was $364,928,298. The population of the United States in that year numbered 50,189,209 persons, so that the output of the mines represented an average of $7.27 for each inhabitant. The census of 1910 shows the population to have increased to 91,972,266 persons. The value of the mineral production in 1910 was $1,990,911,135, or an average of $21.65 for each inhabitant. In other words, the per capita mineral production

in 1910 as expressed in the value of the output was almost exactly three times what it was in 1880.

The most striking increases that have been made in the 30 years covered by this series of reports (from 1882 to 1911) have been in the production of iron, copper, and gold for the metals, and in the fuels (coal, petroleum, and natural gas) and cement for the nonmetals. The value of the pig-iron product has more than trebled, from $106,336,429 to $327,334,624. (In 1910 the pig-iron production was valued at $412,162,486, or nearly four times that of 1882.) The copper production in 1911, $137,154,092, was eight times that of 1882, $16,038,091, and the gold production was nearly three times, $96,890,000 in 1911 against $32,500,000 in 1882. The value of the silver production in 1911 was less than that of 1882 by $8,490,200, or 20.7 per cent, notwithstanding an increase of over 50 per cent in the quantity produced. This condition has been brought about by advances in metallurgy that have cheapened the cost of production. The price of silver in 1911 was less than half what it was in 1882. The combined value of the anthracite and bituminous coal production in 1911 was $626,366,876, or four and one-half times the $146,632,581 output of 1882; the value of the petroleum production was $24,065,988 in 1882 and $134,044,752 in 1911, the latter year being five and one-half times that of the earlier. Natural gas as a mineral product had just arrived in 1882, with a reported value of $215,000, and in 1911 the production was valued at $74,127,534. Next to natural gas the production of cement has shown the greatest percentage of increase, from $3,672,750 in 1882 to $66,248,817 in 1911.

Of the total value of the mineral output of the United States the metals constitute a little more than one-third and the nonmetals a little less than two-thirds. The largest quantity and the greatest value of all the mineral production are represented by the output of the coal mines. The production of coal in 1911 amounted to 496,221,168 short tons, valued at $626,366,876, the value being nearly one-third that of the total value of all the mineral products and equal to 93 per cent of the total metal production.

## RAW AND DERIVED PRODUCTS.

In compiling the statistics of mineral production the value of the metallic products is fixed upon the refined or partly refined metals, which is of course much greater than the value of the ores from which they are obtained. During recent years the statistics of pig-iron production have been supplemented by accurate determinations of the quantity of iron ore produced, with the value thereof, but the quantity and value of the pig iron have been maintained as the units of output. The ores of the precious and semiprecious metals are frequently complex mixtures of several metals, and no quantities or values can be expressed until the contents are extracted in metallic form and become articles of commerce. Chromic iron ore, manganese ore, manganiferous ores, and bauxite (aluminum ore) are marketed as such. In the nonmetals the quantities are expressed and the value placed upon the products in the condition in which they are first sold. With the fuels, with phosphate rock, and with some of the other nonmetals the quantities and values are for the raw product. With cement, however, there is no commercial product

until the material is in the finished state as cement. The clay products appear as finished brick, terra cotta, tile, porcelain, pottery, etc., with the exception of a small quantity of special clays sold raw. The quarry products are sold rough, partly dressed, and finished; salt appears in various refined conditions, as the content of brine, and as rock salt; gypsum is sold at first hands, as crude, as ground, and as calcined. There is no uniformity and there is no way of arriving at the quantities and values of the quarry products except in the condition as first marketed. The desirability of continuing to base the iron production on the output and value of pig iron may be open to some question, particularly since accurate records of the ore production and of the sources from which obtained are now available. In addition to putting a factitious value on the output, the distribution of the production by States gives undue prominence to those in which the blast furnaces are located and deprives the ore-producing States of proper credit. With pig iron the basis of values, the total value of the mineral production in the United States was $1,990,911,135 in 1910 and $1,918,326,253 in 1911, with Pennsylvania, Ohio, Illinois, and West Virginia as the four leading States. These four States are credited with one-half of the total value of the mineral output of the United States. California, with no standing as a producer either of pig iron or of iron ore, is fifth in rank, and Michigan and Minnesota, the leading producers of iron ore, appear as eleventh and thirty-eighth, respectively, in rank. With iron ores as the basis, the same four States remain at the head; but West Virginia, unimportant as a producer of iron ore or as a manufacturer of pig iron, outranked both Ohio and Illinois in 1910 and fell between those States in 1911; Michigan takes sixth place, following California and followed by Minnesota as seventh in rank; New York drops from sixth to thirteenth place, and Colorado from seventh to eighth in 1910 and tenth in 1911. In 1910 the four leading States, with iron ore as the basis, produced $713,081,926, or 41.5 per cent of the total which by the substitution is reduced to $1,719,484,256, and $719,382,360, or 42.9 per cent of the total of $1,677,411,459 for 1911.

In the following tables the States are arranged in the order of their rank as shown by the value of their mineral products in 1910 and 1911—first, with the valuation based on the production of pig iron, as has been customary in the preceding volumes of the series; second, with the iron ores taken as a basis of production:

*Rank of States in value of mineral production in 1910 and 1911.*

1910.

| Rank. | State. | Value, including pig iron and excluding iron ore. | State. | Value, including iron ore and excluding pig iron. |
|---|---|---|---|---|
| 1 | Pennsylvania | $585,402,329 | Pennsylvania | $411,827,343 |
| 2 | Ohio | 185,354,370 | West Virginia | 102,477,594 |
| 3 | Illinois | 140,237,550 | Ohio | 100,004,982 |
| 4 | West Virginia | 105,786,700 | Illinois | 98,772,007 |
| 5 | California | 86,723,743 | California | 86,721,069 |
| 6 | New York | 73,799,494 | Minnesota | 83,868,520 |
| 7 | Colorado | 60,661,422 | Michigan | 83,581,377 |
| 8 | Indiana | 57,784,240 | Colorado | 55,222,574 |
| 9 | Montana | 54,388,119 | Montana | 54,388,119 |
| 10 | Missouri | 52,703,156 | Missouri | 51,857,640 |
| 11 | Alabama | 48,124,174 | New York | 45,954,554 |

*Rank of States in value of mineral production in 1910 and 1911*—Continued.

1910—Continued.

| Rank. | State. | Value, including pig iron and excluding iron ore. | State. | Value, including iron ore and excluding pig iron. |
|---|---|---|---|---|
| 12 | Michigan | $47,306,866 | Indiana | $44,904,701 |
| 13 | Arizona | 43,483,912 | Arizona | 43,483,912 |
| 14 | Utah | 39,233,716 | Utah | 39,233,716 |
| 15 | Nevada | 34,617,127 | Nevada | 34,617,127 |
| 16 | Oklahoma | 32,988,865 | Oklahoma | 32,988,865 |
| 17 | New Jersey | 30,481,826 | Alabama | 30,080,280 |
| 18 | Kansas | 28,304,191 | Kansas | 28,304,191 |
| 19 | Iowa | 22,730,968 | New Jersey | 28,266,383 |
| 20 | Tennessee | 21,301,518 | Iowa | 22,730,968 |
| 21 | Kentucky | 21,132,698 | Kentucky | 19,883,476 |
| 22 | Texas | 18,370,251 | Texas | 18,404,254 |
| 23 | Virginia | 17,629,971 | Alaska | 17,191,688 |
| 24 | Alaska | 17,191,688 | Tennessee | 17,150,742 |
| 25 | Washington | 16,810,808 | Washington | 16,693,030 |
| 26 | Maryland | 15,440,207 | Idaho | 15,437,403 |
| 27 | Idaho | 15,437,403 | Virginia | 13,898,516 |
| 28 | Wisconsin | 13,860,531 | Wisconsin | 13,084,021 |
| 29 | Wyoming | 12,110,286 | Wyoming | 12,766,915 |
| 30 | Louisiana | 10,119,993 | Maryland | 10,238,488 |
| 31 | Florida | 9,284,705 | Louisiana | 10,119,993 |
| 32 | Vermont | 8,720,409 | Florida | 9,284,705 |
| 33 | New Mexico | 7,712,924 | Vermont | 8,720,409 |
| 34 | Minnesota | 6,365,239 | New Mexico | 7,902,036 |
| 35 | South Dakota | 6,095,814 | Georgia | 6,178,429 |
| 36 | Massachusetts | 6,040,736 | South Dakota | 6,095,814 |
| 37 | Georgia | 5,878,902 | Massachusetts | 5,903,976 |
| 38 | Arkansas | 5,373,105 | Arkansas | 5,373,105 |
| 39 | Maine | 4,713,123 | Maine | 4,713,123 |
| 40 | Oregon | 3,739,927 | Oregon | 3,739,927 |
| 41 | Connecticut | 3,448,977 | Connecticut | 3,284,895 |
| 42 | North Carolina | 2,616,581 | North Carolina | 2,730,818 |
| 43 | New Hampshire | 2,142,853 | New Hampshire | 2,142,853 |
| 44 | South Carolina | 2,021,371 | South Carolina | 2,021,371 |
| 45 | Nebraska | 1,552,794 | Nebraska | 1,552,794 |
| 46 | North Dakota | 860,233 | North Dakota | 860,233 |
| 47 | Mississippi | 840,152 | Mississippi | 840,152 |
| 48 | Rhode Island | 800,503 | Rhode Island | 800,503 |
| 49 | Delaware | 664,073 | Delaware | 664,073 |
| 50 | District of Columbia | 288,949 | District of Columbia | 288,949 |
| | Undistributed | 2,231,643 | Undistributed | 2,231,643 |
| | Total | 1,990,911,135 | Total | 1,719,484,256 |

1911.

| | | | | |
|---|---|---|---|---|
| 1 | Pennsylvania | $549,901,327 | Pennsylvania | $414,112,373 |
| 2 | Ohio | 170,544,327 | Illinois | 106,231,455 |
| 3 | Illinois | 137,384,382 | West Virginia | 101,948,248 |
| 4 | West Virginia | 105,958,493 | Ohio | 97,090,284 |
| 5 | California | 90,519,551 | California | 90,517,566 |
| 6 | New York | 63,357,365 | Michigan | 65,077,232 |
| 7 | Colorado | 57,170,961 | Minnesota | 53,460,561 |
| 8 | Missouri | 53,591,612 | Montana | 53,454,926 |
| 9 | Montana | 53,454,926 | Missouri | 52,636,348 |
| 10 | Indiana | 50,202,462 | Colorado | 51,958,239 |
| 11 | Michigan | 45,941,096 | Arizona | 44,104,731 |
| 12 | Arizona | 44,104,731 | Oklahoma | 42,678,446 |
| 13 | Oklahoma | 42,678,446 | New York | 42,392,180 |
| 14 | Utah | 41,139,075 | Utah | 41,139,075 |
| 15 | Alabama | 40,508,343 | Indiana | 37,430,187 |
| 16 | Nevada | 34,148,101 | Nevada | 34,148,101 |
| 17 | New Jersey | 26,984,275 | Alabama | 28,005,278 |
| 18 | Kansas | 24,987,807 | New Jersey | 27,559,246 |
| 19 | Iowa | 21,107,496 | Kansas | 24,987,807 |
| 20 | Tennessee | 20,709,756 | Iowa | 21,107,496 |
| 21 | Alaska | 20,072,420 | Alaska | 20,072,420 |
| 22 | Kentucky | 19,703,061 | Kentucky | 18,910,731 |
| 23 | Texas | 18,817,304 | Texas | 18,817,304 |
| 24 | Idaho | 17,588,340 | Tennessee | 17,902,451 |
| 25 | Virginia | 16,361,461 | Idaho | 17,588,340 |
| 26 | Washington | 15,853,556 | Washington | 15,853,556 |
| 27 | Wisconsin | 14,867,869 | Virginia | 13,609,364 |
| 28 | Maryland | 12,840,892 | Louisiana | 12,710,958 |
| 29 | Louisiana | 12,710,958 | Wisconsin | 12,451,436 |
| 30 | Wyoming | 11,007,060 | Wyoming | 11,486,982 |

*Rank of States in value of mineral production in 1910 and 1911*—Continued.

1911—Continued.

| Rank. | State. | Value, including pig iron and excluding iron ore. | State. | Value, including iron ore and excluding pig iron. |
|---|---|---|---|---|
| 31 | Florida | $10,250,228 | Florida | $10,250,228 |
| 32 | Vermont | 8,434,516 | Maryland | 9,386,663 |
| 33 | South Dakota | 8,037,372 | Vermont | 8,434,516 |
| 34 | New Mexico | 7,723,517 | South Dakota | 8,037,372 |
| 35 | Massachusetts | 6,700,386 | New Mexico | 7,869,918 |
| 36 | Georgia | 5,907,723 | Massachusetts | 6,623,077 |
| 37 | Arkansas | 5,829,606 | Georgia | 6,171,367 |
| 38 | Minnesota | 5,803,628 | Arkansas | 5,829,606 |
| 39 | Maine | 4,645,630 | Maine | 4,645,630 |
| 40 | Connecticut | 3,357,140 | Oregon | 3,198,796 |
| 41 | Oregon | 3,198,796 | Connecticut | 3,151,588 |
| 42 | North Carolina | 2,648,786 | North Carolina | 2,797,155 |
| 43 | South Carolina | 1,804,115 | South Carolina | 1,804,115 |
| 44 | New Hampshire | 1,727,645 | New Hampshire | 1,727,645 |
| 45 | Nebraska | 1,316,168 | Nebraska | 1,316,168 |
| 46 | Rhode Island | 1,088,475 | Rhode Island | 1,088,475 |
| 47 | Mississippi | 1,052,092 | Mississippi | 1,052,842 |
| 48 | North Dakota | 957,425 | North Dakota | 957,425 |
| 49 | Delaware | 491,657 | Delaware | 491,657 |
| 50 | District of Columbia | 277,295 | District of Columbia | 277,295 |
| | Undistributed | 2,856,600 | Undistributed | 2,856,600 |
| | Total | 1,918,326,253 | Total | 1,677,411,459 |

In the first instance, the total value of the mineral products was $1,990,911,135 in 1910, and $1,918,326,253 in 1911. In the second instance, the total value was $1,719,484,256 in 1910, and $1,677,411,459 in 1911. Over 65 per cent of the total mineral production is from the first 10 States, whose aggregate output was valued at $1,128,721,225 in 1910, and at $1,086,487,232 in 1911. Of these 10 leading States, 5—Pennsylvania, West Virginia, Ohio, Illinois, and Michigan—are east of Mississippi River; and 5—California, Minnesota, Colorado, Montana, and Missouri—are west of that boundary. The 5 eastern States produced minerals and mineral substances valued at $796,663,303 in 1910, and at $784,459,592 in 1911, nearly one-half the value of the total mineral production of the United States. The combined production of all the States east of the Mississippi (and these States aggregate only 28.8 per cent of the total area of the country, exclusive of Alaska) was $1,151,567,240, or 67 per cent of the total production of the United States in 1910, and $1,094,083,279, or 65 per cent of the total production in 1911. The States west of the Mississippi, whose areas aggregate 71.2 per cent of the total of the United States, had a combined mineral production valued at $565,685,373, or 33 per cent of the total, in 1910, and $580,471,580, or 35 per cent of the total, in 1911.

## LEADING STATES IN MINERAL PRODUCTION.

Forty-eight States and the Districts of Alaska and Columbia contribute to the mineral production of the United States. The output of the District of Columbia is principally from the clay beds in the form of common brick and drain tile.

Pennsylvania far outranks all other States in the value of its mineral output, having (exclusive of pig iron) contributed 24 per cent of the total in 1910, and 24.7 per cent in 1911. The reason for Pennsyl-

vania's undisputed leadership lies primarily in its great production of coal—it being almost exclusively the source of anthracite and the producer of over one-third of the total bituminous output. Pennsylvania ranks second, next to New York, in the value of its manufactures, and stands first as a mineral producer in the following products, namely: Cement, coal, coke, pig iron, lime, mineral paints, sand and gravel, and building stone, 8 in all. It is second in the production of clay manufactures, natural gas, and graphite; fourth in millstones; fifth in petroleum and sand-lime brick; ninth in iron ore and mineral waters.

The other States are leading producers as follows (the comparisons are based on values, not on quantity of output, though in most instances their relative ranks are identical):

*West Virginia.*—First in the production of natural gas; third in value, though second in quantity, in the production of both coal and coke; ninth in salt; tenth in clay products and pig iron.

*Ohio.*—First in clay products, grindstones, and pulp stones; second in pig iron, bromine, and lime; third in salt, natural gas, sand and gravel, gypsum, and oilstones; fourth in coal and stone; sixth in petroleum.

*Illinois.*—First in fluorspar; second in value, though third in quantity, in coal; second in infusorial earth; third in petroleum and pig iron; fourth in coke, in clay products, and in sand and gravel; fifth in cement, seventh in stone.

*California.*—First in petroleum, asphalt, borax, gems and precious stones, magnesite, platinum, and quicksilver; second in gold and tungsten ore; third in infusorial earth and pyrite; fourth in quantity and third in value of Portland cement.

*Michigan.*—First in sand-lime brick and bromine; second in iron ore, salt, and grindstones; third in copper; fourth in gypsum.

*Minnesota.*—First in iron ore; second in sand-lime brick; seventh in mineral waters.

*Colorado.*—First in gold, tungsten ore, and vanadium minerals; second in zinc; third in fluorspar; fourth in silver, lead, and mica.

*Missouri.*—First in lead, zinc, barytes, and infusorial earth; fourth in mineral paints; fifth in lime, and sand and gravel; sixth in cement.

*New York.*—First in salt, emery, abrasive garnet, graphite, gypsum, millstones, and talc; second in stone, mineral waters, sand and gravel, and pyrite; third in mineral paints, and sand-lime brick; fourth in iron ore, pig iron, feldspar, infusorial earth; fifth in clay products and slate; sixth in natural gas.

*Arizona.*—First in the production of copper.

*Nevada.*—First in silver; third in gold and quicksilver; fifth in copper; seventh in lead.

*Virginia.*—First in manganese ore and pyrite; second in millstones and soapstone; fourth in slate and barytes; fifth in coke; sixth in iron ore, mineral waters, and gypsum; seventh in pig iron.

*Wisconsin.*—First in mineral waters; third in lime; fourth in zinc and pyrite; fifth in iron ore and lead; sixth in mineral paints; ninth in stone.

*Louisiana.*—First in sulphur; sixth in salt; eighth in petroleum; ninth in natural gas.

*Florida.*—First in phosphate rock and fuller's earth; fourth in sand-lime brick.

*Vermont.*—First in asbestos; second in slate; third in stone and soapstone.

*Arkansas.*—First in bauxite and oilstones; third in fuller's earth.

*Maine.*—First in feldspar; third in slate; fourth in lime and mineral waters.

*North Carolina.*—First in mica, monazite, and zircon; second in barytes; third in millstones; fourth in talc and soapstone.

*Nebraska.*—First in the production of pumice.

*Indiana.*—Second in cement and oilstones; third in mineral waters; fifth in coal and stone; sixth in pig iron, coke, clay products, and sand-lime brick; seventh in natural gas, and sand and gravel.

*Utah.*—Second in vanadium minerals; third in silver, lead, and asphalt; fourth in copper; sixth in gold; seventh in zinc and precious stones; eighth in salt.

*Oklahoma.*—Second in petroleum; fifth in natural gas and asphalt; sixth in lead.

*Kansas.*—Second in pumice; third in cement; fourth in natural gas (third in quantity) and salt; sixth in zinc; seventh in gypsum.

*Iowa.*—Second in gypsum; eighth in clay products and sand-lime brick; ninth in coal.

*Kentucky.*—Second in fluorspar; fourth in asphalt; fifth in barytes; seventh in coal.

*Texas.*—Second in asphalt and quicksilver; fourth in fuller's earth; fifth in gypsum; seventh in salt and petroleum; ninth in silver; tenth in sand and gravel; eleventh in cement.

*Tennessee.*—Second in phosphate rock; third in barytes; fourth in bauxite; fifth in mineral paints; seventh in copper; eighth in iron ore and pig iron; eleventh in coal.

*Idaho.*—Second in lead; fourth in asbestos; fifth in silver; ninth in gold, copper, and zinc.

*Georgia.*—Second in asbestos, fuller's earth, bauxite, and mineral paints; fourth in barytes and graphite; fifth in pyrite.

*South Dakota.*—Second in mica; fifth in gold.

*Oregon.*—Second in platinum; ninth in sand and gravel; eleventh in gold.

*South Carolina.*—Second in monazite; third in phosphate rock; fifth in mica.

*Alabama.*—Third in iron ores, bauxite, and graphite; third in quantity and second in value in coke.

*New Jersey.*—Third in clay products and zinc; sixth in sand and gravel; seventh in iron ore and cement.

*Wyoming.*—Third in asbestos; tenth in coal.

*Connecticut.*—Third in the production of feldspar.

*New Hampshire.*—Third in the production of mica.

*Alaska.*—Fourth in the production of gold.

*Maryland.*—Fifth in feldspar and infusorial earth; sixth in slate; ninth in pig iron; twelfth in coke; thirteenth in coal.

*New Mexico.*—Fifth in precious stones; sixth in the production of mica; eighth in silver and zinc; ninth in lead.

*Massachusetts.*—Fifth in talc and soapstone; sixth in lime and fuller's earth; seventh in mica and pyrite; eighth in stone, mineral waters, and sand and gravel.

## INDIVIDUAL STATES.

### ALABAMA.

If pig iron is considered the basis of the iron production, Alabama ranks fifteenth among the States in value of mineral products. In the States south of Mason & Dixon's line and Ohio River, Alabama ranks second. If iron ores are taken as the basis Alabama takes seventeenth place among all the States, but maintains second place among the Southern States. The State is not the premier producer of any important mineral substance, but it ranks third in the production of iron ore; it ranks fourth in quantity and fifth in value of the pig iron produced; it is third in quantity and second in value of coke production; and it ranks sixth among the coal-producing States. It is third in the production of bauxite and graphite. Its production of gold and silver is negligible, and although some progress has been made in the development of its clay-working and quarrying industries these resources have not been exploited to the same extent as those of coal and iron.

The development of the mining industry began in 1882, the first year covered by this series of statistical reports, when attention was directed to the extensive iron deposits in the vicinity of Birmingham and contiguous to plentiful supplies of coking coal and limestone. The "boom" which followed was without precedent in the history of industrial development. The production of coal, which in 1881 was less than 350,000 tons, rose to nearly 2,500,000 tons in 1885. As in all cases of this kind speculation became wild and values were unreasonably inflated. The boom was succeeded by a relapse and two years of readjustment, and then followed a quarter century of steady and healthful growth. The maximum production of iron ore, of pig iron, of coal, and of coke was made in 1910, in which year the output of iron ore was 4,801,275 long tons, valued at $6,083,722; the pig iron production was 1,969,770 long tons, valued at $24,127,616; the production of coal was 16,111,462 short tons, valued at $20,236,853, and that of coke was 3,249,027 short tons, valued at $9,165,821. The depression in the iron trade of 1911 reduced the production of all four items. The output of iron ore fell off to 3,955,582 long tons, valued at $4,876,106; pig iron to 1,617,150 long tons, valued at $17,379,171; coal to 15,021,421 short tons, valued at $19,079,949; and coke to 2,761,521 short tons, valued at $7,593,594. The total value of the mineral production of Alabama, iron ore included and pig iron excluded, was $30 080,280 in 1910, decreasing to $28,005,278 in 1911. The decreases in Alabama were less in proportion, however, than those of other iron-producing States. The occurrence of the iron ore, coking coals, and limestone in close proximity in Alabama enables that State to produce iron at less cost than any other iron region in the world; wherefore in years of depression in the iron trade the reaction is felt less in Alabama than elsewhere, and the State proportion of the total production is augmented. The iron ores are principally non-Bessemer hematites. The chief steel production is open hearth. The principal coal-producing counties are Jefferson, Walker, Bibb, and Tuscaloosa, in the order named; the principal iron-ore counties are Jefferson, Tuscaloosa, Etowah, and Franklin. The iron-making industry is centered in Birmingham and vicinity.

In the following table is presented a comparison of the mineral output of Alabama in 1910 and 1911. The total values given at the bottom of the table include the value of the iron ore and of the coal made into coke, but do not include the value of pig iron or coke.

*Mineral production of Alabama in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Bauxite..long tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | 406,214 | $387,600 | ..... | ..... | 593,911 | $529,359 |
| Clay products, short tons..... | 75,082 | b $38,045 | ..... | 1,667,559 | 35,203 | b $29,909 | ..... | 1,947,102 |
| Coal.....short tons.. | 16,111,462 | 20,236,853 | ..... | ..... | 15,021,421 | 19,079,949 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 3,249,027 | b9,165,821 | ..... | ..... | 2,761,521 | b7,593,594 |
| Gold, fine ounces (troy)..... | ..... | ..... | 1,592 | 32,900 | ..... | ..... | 890 | 18,400 |
| Graphite, crystalline, pounds..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Iron ore..long tons.. | 4,801,275 | 6,083,722 | ..... | ..... | 3,955,582 | 4,876,106 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | 1,969,770 | b24,127,616 | ..... | ..... | 1,617,150 | b17,379,171 |
| Lime....short tons.. | ..... | ..... | 81,696 | 303,612 | ..... | ..... | 76,406 | 300,787 |
| Mica..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (a) |
| Millstones..... | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (a) |
| Mineral waters, gallons sold..... | 133,159 | 30,639 | ..... | ..... | 205,854 | 26,982 | ..... | ..... |
| Natural gas..... | ..... | (a) | ..... | ..... | ..... | (a) | ..... | ..... |
| Sand and gravel, short tons..... | 619,253 | 187,591 | ..... | ..... | 677,894 | 215,413 | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 300 | 200 | ..... | ..... | 200 | 100 |
| Stone..... | ..... | (c) | ..... | c1,054,568 | ..... | (c) | ..... | c 923,998 |
| Miscellaneous..... | ..... | 95,036 | ..... | ..... | ..... | 78,652 | ..... | 8,430 |
| Total value, eliminating duplications. | | $30,080,280 | | | | $28,005,278 | | |

a Value included under "Miscellaneous."
b Not included in total value.
c Derived product includes stone sold rough in 1910 and 1911 and millstones in 1910.

## ALASKA.

According to Alfred H. Brooks, geologist in charge of the division of Alaskan mineral resources, mining in Alaska began in 1880, since which date the total value of the mineral production has amounted approximately to $207,000,000; over 90 per cent (or $195,619,776) of this is represented by the value of gold. In 1911 Alaska ranked fourth among the States and Territories as a gold producer. The gold amounted to 806,179 fine ounces, valued at $16,665,200, against 787,148 fine ounces, valued at $16,271,800 in 1910. Copper mining was actively pushed during 1911, and a total of 22,314,889 pounds, valued at $2,789,361, was obtained, against 4,311,026 pounds, valued at $547,500 in 1910. The silver production of Alaska is much less important than that of gold and copper, and amounted to $83,100 in 1910, and to $252,900 in 1911. The only other mineral products at the present time are graphite, gypsum, and marble, with small quantities of coal, lead, and tin.

The production of coal is approximately 1,000 tons annually. The development of the mining and other industries of Alaska is held

back by want of legislation which will permit the exploitation of the known extensive and valuable coal fields. The need of coal on the Pacific coast, which a few years ago would have been an inducement for the opening of the Alaskan coal fields, has now been supplied by the outflow of petroleum from wells in California. The only present demand for Alaskan coals would be for local consumption in the Territory, for the use of the Navy, and to supply coke to the smelters and foundries on Puget Sound, at Portland, San Francisco, Los Angeles, and other cities on the Pacific coast Most of the coke now consumed on the Pacific coast is imported from Germany or England or is brought from the Eastern States.

The following table gives the quantity and value of the mineral production of Alaska for 1910 and 1911:

*Mineral production of Alaska in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Coal.....short tons.. | 1,000 | $15,000 | ..... | ..... | 900 | $7,200 | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 4,311,026 | $547,500 | ..... | ..... | 22,314,889 | $2,789,361 |
| Gold, fine ounces (troy)..... | ..... | ..... | 787,148 | 16,271,800 | ..... | ..... | 806,179 | 16,665,200 |
| Graphite, crystalline, pounds..... | (a) | (a) | ..... | ..... | ..... | ..... | ..... | ..... |
| Gypsum..short tons.. | (b) | ..... | ..... | (b) | (b) | ..... | ..... | (b) |
| Lead.....do.... | ..... | ..... | 60 | 5,280 | ..... | ..... | 50 | 4,500 |
| Silver, fine ounces (troy)..... | ..... | ..... | 153,900 | 83,100 | ..... | ..... | 468,300 | 252,900 |
| Stone..... | ..... | (a) | ..... | ..... | ..... | (a) | ..... | ..... |
| Tin (concentrates), short tons..... | ..... | ..... | 15 | 7,560 | ..... | ..... | 92 | 52,409 |
| Miscellaneous..... | ..... | (c) | ..... | c 261,448 | ..... | (c) | ..... | c 300,850 |
| Total value, eliminating duplications.. | $17,191,688 | | | | $20,072,420 | | | |

a Value included under "Miscellaneous."
b Calcined in Washington State. Value included under "Miscellaneous."
c Derived product includes raw product.

## ARIZONA.

The chief mining industry of Arizona is copper, in the production of which the new State ranks first. It ranks sixth in the production of silver and seventh in the production of gold. These three metals constitute 98 per cent of the total production of the State, which amounted to $43,483,912 in 1910 and $44,104,731 in 1911. The value of the copper product alone represents 86 per cent of the total output and the gold production about 8 per cent. The leading counties in the production of copper are Cochise, Greenlee, Yavapai, Gila, and Pima, and the counties furnishing the larger portion of the gold production are Mohave, Yavapai, Cochise, and Yuma. Siliceous ores furnish nearly two-thirds of the gold and nearly one-third is obtained in the reduction of copper ores. Smaller quantities are obtained from lead and zinc ores and from placers. Cochise and Yavapai counties are the principal producers of silver, most of which comes from copper ores.

The statistics of production in Arizona in 1910 and 1911 are shown in the following table:

*Mineral production of Arizona in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | ..... | ..... |
| Clay products, short tons..... | (a) (b) | (a) (b) | ..... | $126,777 | ..... | ..... | ..... | $106,882 |
| Copper.....pounds.. | ..... | ..... | 297,250,538 | 37,750,818 | ..... | ..... | 303,202,532 | 37,900,317 |
| Gems and precious stones..... | ..... | ..... | ..... | 32,510 | ..... | ..... | ..... | 17,643 |
| Gold, fine ounces (troy)..... | ..... | ..... | 165,114 | 3,413,200 | ..... | ..... | 170,348 | 3,521,400 |
| Gypsum..short tons.. | (a) | ..... | ..... | (a) | (a) | ..... | ..... | (a) |
| Lead.....do.... | ..... | ..... | 858 | 75,504 | ..... | ..... | 3,450 | 310,500 |
| Lime.....do.... | ..... | ..... | 13,728 | 68,055 | ..... | ..... | 13,844 | 69,940 |
| Quartz.....do.... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Silver, fine ounces, (troy)..... | ..... | ..... | 2,655,700 | 1,434,100 | ..... | ..... | 3,228,900 | 1,743,600 |
| Stone..... | ..... | (c) | ..... | c 163,696 | ..... | (c) | ..... | c 55,714 |
| Sulphuric acid (60° Baumé)b, short tons..... | ..... | ..... | ..... | (d) | ..... | ..... | (d) | (d) |
| Tungsten ore (60 per cent concentrates), short tons..... | ..... | ..... | (a) | (a) | ..... | ..... | 50 | 16,559 |
| Zinc.....short tons.. | ..... | ..... | 2,594 | 280,152 | ..... | ..... | 2,476 | 282,264 |
| Miscellaneous..... | ..... | $48,520 | ..... | 93,795 | ..... | $13,765 | ..... | 66,147 |
| Total value, eliminating duplications.. | | | $43,483,912 | | | | $44,104,731 | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes stone sold rough.
d From copper smelters. No report for 1910. Value included under "Miscellaneous."

## ARKANSAS.

Arkansas ranks thirty-eighth among the States in the value of its mineral production. The principal product is coal, which constitutes over 50 per cent of the total value. Arkansas is the premier State in the production of two minerals—bauxite and novaculite, the former being the ore of aluminum, the latter the source of the larger part of the oilstones produced in the United States. It ranks third among the States in the production of fuller's earth. Next to coal the greatest value of the mineral production of Arkansas is represented by the clay-working industries, and bauxite mining is third in importance. Coal is mined in 7 counties, of which Sebastian is by far the most important with over 70 per cent of the total output. Franklin County is second in importance, and Johnson third. The coals of Arkansas are generally high grade, and some approach anthracite in quality. The semianthracite of Arkansas is much prized as a domestic fuel, reaching markets as far north as Kansas City. Owing, however, to the high cost of labor, to the unfavorable mining conditions, and to the competition with petroleum and natural gas and with coals from other States, the coal-mining industry has been practically at a

standstill for the last 10 years. The production in 1910 was less than in 1902, and that of 1911 was less than in 1903 and than the average of the 10 years ending with 1911.

The statistics of the mineral production of Arkansas in 1910 and 1911 are shown in the following table:

*Mineral production of Arkansas in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Bauxite...long tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Clay products..... | ..... | ..... | ..... | $578,455 | ..... | ..... | ..... | $480,643 |
| Coal.....short tons.. | 1,905,958 | $2,979,213 | ..... | ..... | 2,106,789 | $3,396,849 | ..... | ..... |
| Fuller's earth..do.... | 2,563 | 29,137 | ..... | ..... | (a) | (a) | ..... | ..... |
| Gems and precious stones..... | ..... | ..... | ..... | 1,200 | ..... | ..... | ..... | 2,700 |
| Lead....short tons.. | ..... | ..... | ..... | ..... | ..... | ..... | 15 | 1,350 |
| Lime.....do.... | ..... | ..... | 26,532 | 127,068 | ..... | ..... | 22,847 | 109,067 |
| Manganese ore and manganiferous ore, long tons..... | 5,530 | 14,700 | ..... | ..... | b 2,177 | b 5,354 | ..... | ..... |
| Mineral waters, gallons sold..... | 1,065,676 | 89,772 | ..... | ..... | 1,560,157 | 118,994 | ..... | ..... |
| Natural gas..... | ..... | (a) | ..... | ..... | ..... | (a) | ..... | ..... |
| Oil stones..... | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (a) |
| Phosphate rock, long tons..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons..... | 1,061,037 | 230,680 | ..... | ..... | 1,007,589 | 183,897 | ..... | ..... |
| Slate..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (a) |
| Stone..... | ..... | 81,015 | ..... | 301,596 | ..... | (d) | ..... | d 526,352 |
| Zinc.....short tons.. | ..... | ..... | 286 | 30,888 | ..... | ..... | 385 | 43,890 |
| Miscellaneous..... | ..... | c 909,381 | ..... | ..... | ..... | 864,043 | ..... | 96,467 |
| Total value, eliminating duplications.. | $5,373,105 | | | | $5,829,606 | | | |

a Value included under "Miscellaneous."
b Manganiferous ore only.
c "Miscellaneous" raw products include oilstones.
d Derived product includes stone sold rough.

## CALIFORNIA.

Whether pig iron or iron ore is taken as a basis of mineral production, California ranks fifth among the States in the value of its output. It is first among the States west of Mississippi River. In former years California rested its claim to distinction as a mineral producer on its output of gold, in which it held first place in 1911, though in recent years it has usually fallen behind Colorado in the production of gold. The premiership of gold in the State has been succeeded by petroleum, the value of which in California exceeds that of gold by 94 per cent, and gives the State first place among the States in the production of crude oil. California leads also in the production of asphalt, of platinum, and of quicksilver, and enjoys a monopoly in the production of borax and magnesite. It is second in the production of tungsten ores, being exceeded by Colorado; it ranks third in the production of cement, sixth in the production of copper, and stands well up among the States in the production of a number of less important minerals. The values of the more important products in the last two years have been as follows: Petroleum, $35,749,473 in

1910 and $38,719,080 in 1911; gold, $20,441,400 in 1910 and $19,928,500 in 1911; cement, $7,355,301 in 1910 and $8,737,150 in 1911; copper, $5,811,545 in 1910 and $4,479,456 in 1911; clay products, $4,842,391 in 1910 and $4,915,866 in 1911; stone, $4,245,892 in 1910 and $4,676,902 in 1911; asphalt, $1,338,736 in 1910 and $2,104,121 in 1911; borax, $1,201,842 in 1910 and $1,569,151 in 1911. The principal petroleum-producing counties are, Kern (producing over half of the total for the State), Fresno, Santa Barbara, Los Angeles, and Orange, in the order of their importance. Seven counties produce gold in excess of $1,000,000 in value yearly, namely and in order: Yuba, Amador, Nevada, Butte, Shasta, Sacramento, and Calaveras. Of the total gold production of California about 55 per cent is from deep mines and 45 per cent from placers. Nearly 90 per cent of the placer gold is the output of the dredges. Of the deep mine product 94 per cent is from siliceous ores, the other 6 per cent being obtained from copper and lead ores. The production of copper comes chiefly from Shasta County (over 80 per cent of the total) with Calaveras second (about 15 per cent of the total).

The total value of the mineral production of California in 1911 was $90,517,566, against $86,721,069 in 1910. The details by substances are shown in the following table:

*Mineral production of California in 1910 and 1911.*

| Product. | 1910. | | | | 1911. | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asphalt..short tons.. | 38,799 | $140,954 | 104,687 | $1,197,782 | 36,081 | $215,230 | 154,864 | $1,889,191 |
| Briquets, fuel..do.... | ..... | ..... | ..... | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Borax.....do.... | 42,357 | 1,201,842 | ..... | ..... | 53,330 | 1,569,151 | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | (c) | (c) | ..... | ..... | 6,317,701 | 8,737,150 |
| Chromite..long tons.. | 205 | 2,729 | ..... | ..... | 120 | 1,629 | ..... | ..... |
| Clay products, short tons..... | 70,465 | b 104,163 | ..... | 4,842,391 | 87,256 | b 112,316 | ..... | 4,915,866 |
| Coal.....short tons.. | 11,164 | 18,336 | ..... | ..... | 10,747 | 16,097 | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 45,760,200 | 5,811,545 | ..... | ..... | 35,835,651 | 4,479,456 |
| Feldspar.short tons.. | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Fuller's earth..do.... | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Gems and precious stones..... | ..... | ..... | ..... | 104,648 | ..... | ..... | ..... | 28,370 |
| Gold, fine ounces (troy)..... | ..... | ..... | 988,853 | 20,441,400 | ..... | ..... | 964,041 | 19,928,500 |
| Gypsum, short tons.. | 45,901 | ..... | ..... | 242,203 | 43,855 | ..... | ..... | 204,264 |
| Infusorial earth..... | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (c) |
| Iron ore...long tons.. | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | (b) (c) | (b) (c) | ..... | ..... | (b) (c) | (b) (c) |
| Lead.....short tons.. | ..... | ..... | 1,160 | 102,080 | ..... | ..... | 615 | 55,350 |
| Lime.....do.... | ..... | ..... | 63,759 | 613,242 | ..... | ..... | 72,858 | 564,175 |
| Magnesite.....do.... | 12,443 | 74,658 | ..... | ..... | 9,375 | 75,000 | ..... | ..... |
| Manganese ore, long tons..... | ..... | ..... | ..... | ..... | (c) | (c) | ..... | ..... |
| Mineral paints, natural pigments, short tons..... | ..... | ..... | 2,116 | 36,470 | ..... | ..... | (c) | (c) |
| Mineral waters, gallons sold..... | 2,008,697 | 394,841 | ..... | ..... | 2,310,237 | 578,439 | ..... | ..... |
| Natural gas..... | ..... | 476,697 | ..... | ..... | ..... | 800,714 | ..... | ..... |
| Petroleum...barrels.. | 73,010,560 | 35,749,473 | ..... | ..... | 81,134,391 | 38,719,080 | ..... | ..... |
| Platinum,fine ounces (troy)..... | ..... | ..... | 337 | 8,386 | ..... | ..... | 511 | 14,873 |
| Pyrite....long tons.. | 27,158 | 129,504 | ..... | ..... | 48,415 | 182,787 | ..... | ..... |
| Quicksilver...flasks.. | ..... | ..... | 17,211 | 800,484 | ..... | ..... | 18,860 | 867,749 |

a No report for 1910.
b Value not included in total value.
c Value included under "Miscellaneous."

*Mineral production of California in 1910 and 1911*—Continued.

| Product. | 1910. | | | | 1911. | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Salt.....barrels.. | 78,571 | 39,000 | 858,943 | 480,667 | 23,350 | 11,442 | 1,062,813 | 543,917 |
| Sand and gravel, short tons..... | 2,065,297 | 440,950 | ..... | ..... | 1,911,652 | 416,980 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | 43,512 | ..... | ..... | ..... | 19,535 |
| Silver, fine ounces (troy)..... | ..... | ..... | 1,791,600 | 967,500 | ..... | ..... | 1,270,900 | 686,300 |
| Slate..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | ..... |
| Stone..... | ..... | (a) | ..... | (a) | ..... | (b) | ..... | b4,676,902 |
| Sulphuric acid (60° Baumé),d short tons..... | ..... | ..... | ..... | (c) | ..... | ..... | (d) | (d) |
| Talc.....short tons.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Tungsten ore (60 per cent concentrates), short tons..... | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Zinc.....short tons.. | ..... | ..... | ..... | ..... | ..... | ..... | 959 | 109,326 |
| Miscellaneous..... | ..... | 8,511 | ..... | 12,354,464 | ..... | 4,915 | ..... | 312,525 |
| Total value, eliminating duplications.... | $86,721,069 | | | | $90,517,566 | | | |

a Value included under "Miscellaneous."
b Derived product includes stone sold rough.
c No report for 1910.
d From copper smelters. Value included under "Miscellaneous."

## COLORADO.

Colorado was the first State in the production of gold in 1910, having a lead over California of less than $100,000. In 1911 production fell off in both States, and as the decrease in Colorado was more than in California, the latter State became again, as it had been in earlier years, the principal source of the yellow metal. Colorado ranks tenth among all the States in the total value of its mineral production, and is fifth among the States west of Mississippi River. Gold is the principal mineral product of the State, with coal a good second. The gold output was valued at $20,526,500 in 1910 and at $19,138,800 in 1911. The production of coal decreased from 11,973,736 short tons, valued at $17,026,934, in 1910 to 10,157,383 tons, valued at $14,747,764, in 1911. As a producer of coal Colorado ranks first among the Western States. It is also the leading Western State in the manufacture of pig iron and of coke. Pig iron is third in value among the products of the State, followed in order by zinc, silver, coke, lead, clay products, stone, and copper. Colorado is the leading State in the production of tungsten ores and vanadium minerals, second in the production of gold and zinc, third in the production of fluorspar, fourth in lead, silver, and mica.

Teller County produces more than one-half the total gold output of the State, all from deep mines and all from siliceous ores unmixed with other metals. The other important gold-producing counties are San Miguel, Ouray, Lake, San Juan, Gilpin, and Clear Creek. Ninety-five per cent of the total output of gold in the State is from siliceous ores. In the production of coal Las Animas County bears nearly the same relation to the total output that Teller County does for gold,

almost one-half of the total coal production coming from Las Animas County. Huerfano County is second in production of coal, with 20 per cent of the total, Boulder, Fremont, and Gunnison following in the order named.

As shown in the following table the total value of the mineral production of Colorado decreased from $55,222,574, in 1910, to $51,958,239 in 1911:

*Mineral production of Colorado in 1910 and 1911.*

| Product. | 1910. | | | | 1911. | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Bismuth..short tons | ..... | ..... | (a) | (a) | ..... | ..... | ..... | ..... |
| Cement.....barrels | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons | 105,874 | b $83,855 | ..... | $2,033,714 | 95,127 | b $83,636 | ..... | $1,606,709 |
| Coal.....short tons | 11,973,736 | 17,026,934 | ..... | ..... | 10,157,383 | 14,747,764 | ..... | ..... |
| Coke.....do | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Copper.....pounds | ..... | ..... | 9,307,497 | 1,182,052 | ..... | ..... | 9,791,861 | 1,223,983 |
| Fluorspar..short tons | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Fuller's earth..do | (a) | (a) | ..... | ..... | ..... | ..... | ..... | ..... |
| Gems and precious stones | ..... | ..... | ..... | 9,280 | ..... | ..... | ..... | 2,520 |
| Gold, fine ounces (troy) | ..... | ..... | 992,969 | 20,526,500 | ..... | ..... | 925,839 | 19,138,800 |
| Graphite, amorphous, short tons | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Grindstones | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Gypsum..short tons | 45,820 | ..... | ..... | 119,259 | 26,226 | ..... | ..... | 67,199 |
| Iron ore...long tons | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Iron, pig.....do | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Lead.....short tons | ..... | ..... | 35,685 | 3,140,280 | ..... | ..... | 30,621 | 2,755,890 |
| Lime.....do | ..... | ..... | 8,057 | 40,860 | ..... | ..... | 6,403 | 34,614 |
| Manganiferous ore, long tons | 55,770 | 176,448 | ..... | ..... | 41,753 | 109,340 | ..... | ..... |
| Mica | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Mineral waters, gallons sold | 1,638,984 | 115,289 | ..... | ..... | 1,436,066 | 104,763 | ..... | ..... |
| Natural gas | ..... | (a) | ..... | ..... | ..... | (a) | ..... | ..... |
| Petroleum...barrels | 239,794 | 243,402 | ..... | ..... | 226,926 | 228,104 | ..... | ..... |
| Sand and gravel, short tons | 1,197,751 | 154,039 | ..... | ..... | 247,666 | 65,366 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Silver, fine ounces (troy) | ..... | ..... | 8,523,000 | 4,602,400 | ..... | ..... | 7,331,200 | 3,958,800 |
| Stone | ..... | (c) | ..... | c1,177,785 | ..... | (c) | ..... | c1,514,827 |
| Sulphuric acid (60° Baumé), e short tons | ..... | ..... | ..... | (e) | ..... | ..... | (e) | (e) |
| Tungsten ore (60 per cent concentrates), short tons | ..... | ..... | 1,221 | 535,567 | ..... | ..... | 730 | 234,513 |
| Uranium and vanadium ores, short tons | ..... | ..... | (a) (d) | (a) (d) | ..... | ..... | 8,400 | 302,000 |
| Zinc.....short tons | ..... | ..... | 23,238 | 2,509,704 | ..... | ..... | 42,233 | 4,814,562 |
| Miscellaneous | ..... | 72,355 | ..... | 10,700,037 | ..... | 77,133 | ..... | 9,112,517 |
| Total value, eliminating duplications | $55,222,574 | | | | $51,958,239 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes stone sold rough.
d Vanadium only.
e From zinc smelters. No report for 1910. Value included under "Miscellaneous."

## CONNECTICUT.

The principal mineral products of Connecticut are from the quarries and clay pits. A small quantity of iron ore is mined and a small quantity of pig iron is made in the State, but aside from this there is no metal mining of any sort, nor any production of mineral fuel. The quarrying industry yielded stone products valued at $1,057,874 in 1910, and at $1,215,462 in 1911. The principal stones quarried are granite and trap rock. The principal granite operations are in New Haven and New London counties, and trap rock is produced in Hartford and New Haven counties. The clay products were valued at $1,478,936 in 1910, and at $1,284,166 in 1911. Lime to the value of $417,850 was produced in 1910 and to the value of $328,904 in 1911. The lime-producing counties are Fairfield and Litchfield, in the extreme western part of the State.

Connecticut is the third State in the Union in the production of feldspar, with an output valued at $89,974 in 1910 and at $73,557 in 1911. Its other commercial mineral products are infusorial earth, mineral waters, quartz, sand-lime brick, sand and gravel. The total value of the mineral products, as shown in the following table, was $3,284,895 in 1910 and $3,151,588 in 1911.

*Mineral production of Connecticut in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | (a) (b) | (a) (b) | ..... | $1,478,936 | ..... | ..... | ..... | $1,284,166 |
| Feldspar, short tons | 18,739 | $89,974 | ..... | ..... | 16,497 | $73,557 | ..... | ..... |
| Infusorial earth | ..... | ..... | ..... | (b) | ..... | ..... | ..... | (b) |
| Iron ore, long tons | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Iron, pig, do | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Lime, short tons | ..... | ..... | 93,576 | 417,850 | ..... | ..... | 69,719 | 328,904 |
| Mineral waters, gallons sold | 1,608,775 | 109,853 | ..... | ..... | 2,164,701 | 182,744 | ..... | ..... |
| Quartz, short tons | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Sand and gravel, short tons | 16,676 | 12,775 | ..... | ..... | 20,270 | 10,559 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (b) |
| Stone | ..... | (c) | ..... | c1,057,874 | ..... | (c) | ..... | c1,215,462 |
| Miscellaneous | ..... | 117,458 | ..... | 251,920 | ..... | 55,436 | ..... | 243,880 |
| Total value, eliminating duplications | $3,284,895 | | | | $3,151,588 | | | |

a Value not included in total value.
b Value included under "Miscellaneous."
c Derived product includes stone sold rough.

## DELAWARE.

Delaware is limited in its mineral production to its quarries and to its clay, sand, and gravel pits. All of these are of small importance when compared with those of other States. The total production of the State in 1911 was valued at $491,657, of which $218,234 was represented by the output of the stone quarries and $200,610 by the clay products. In 1910 the total production was valued at

$664,073, of which $357,708 was furnished by the quarries and $216,555 by the clay works.

The statistics of mineral production in Delaware in 1910 and 1911 are given in the following table:

*Mineral production of Delaware in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | 11,117 | [a]$60,744 | ..... | $216,555 | 7,950 | [a]$46,024 | ..... | $200,610 |
| Mineral waters, gallons sold | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Sand and gravel, short tons | 164,056 | 66,869 | ..... | ..... | 137,205 | 65,813 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (b) | ..... | ..... | ..... | ..... |
| Stone | ..... | 243,896 | ..... | 113,812 | ..... | (c) | ..... | [c]218,234 |
| Miscellaneous | ..... | (c) | ..... | [c]22,941 | ..... | 7,000 | ..... | ..... |
| Total value, eliminating duplications | $664,073 | | | | $491,657 | | | |

[a] Value not included in total value.
[b] Value included under "Miscellaneous."
[c] Derived product includes raw product.

## DISTRICT OF COLUMBIA.

The mineral production in the District of Columbia is principally the output of the clay beds in the vicinity of Washington. The main products from these are common building brick, terra cotta, and drain tile. A small quantity of stone is quarried for use in concrete for foundations and for road making. One plant for making sand-lime brick is established in the District, and the waters from two springs are sold commercially.

The statistics of mineral production in the District of Columbia in 1910 and 1911 are shown in the following table:

*Mineral production of the District of Columbia in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products | ..... | ..... | ..... | [a]$242,861 | ..... | ..... | ..... | [a]$227,520 |
| Mineral waters, gallons sold | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (b) | ..... | ..... | ..... | (b) |
| Stone | ..... | ..... | ..... | ..... | ..... | (b) | ..... | ..... |
| Miscellaneous | ..... | (c) | ..... | [c]46,088 | ..... | (c) | ..... | [c]49,775 |
| Total value, eliminating duplications | $288,949 | | | | $297,295 | | | |

[a] Exclusive of pottery, which is included under "Miscellaneous."
[b] Value included under "Miscellaneous."
[c] Derived product includes raw product.

## FLORIDA.

The mining industry of Florida may be said to have had its beginning in the discovery of the phosphate beds in 1888 and 1889. Public attention has been called to the possibilities of what has since grown to an important industry, in Mineral Resources for 1884, about five years before. The first ten years following the discovery of commercial deposits were notable principally as an area of promotion of the speculative type, of inflated values, and of over production, with the usual collapse and readjustment. The boom in Florida phosphate lands and the aftermath were somewhat akin to the iron boom of Birmingham, Ala., about 10 years earlier. After the collapse values were readjusted; development since has proceeded along natural and conservative lines, and the production of Florida phosphate is an established and prosperous industry. Four kinds of phosphate are produced—hard rock, soft rock, land pebble, and river pebble, the first mentioned being generally the highest grade and the only one for which there is demand for export.

Florida is the leading State in the production of phosphate rock, which constitutes 95 per cent of the States' mineral production. In 1910 the total value of the mineral output of Florida was $9,284,705, of which $8,647,774 was the value of the phosphate rock produced. In 1911 the phosphate product was valued at $9,473,638, and the total value of all mineral products was $10,250,228. The leading counties in the production of phosphate rock are Polk, Citrus, Alachua, and Marion.

Florida is also the premier State in the production of fuller's earth, a variety of clay used principally for filtering and clarifying animal, mineral, and vegetable oils, and in 1911 it lead in the production of ball clay. It is fourth in the production of sand-lime brick. Other products are clay and its manufactures, lime, mineral waters, sand, and gravel. The following table gives the production of minerals in Florida in 1910 and 1911:

*Mineral production of Florida in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | 27,403 | [a]$134,542 | ..... | $237,268 | 24,167 | [a]$114,751 | ..... | $217,535 |
| Fuller's earth, short tons | 18,832 | 170,267 | ..... | ..... | 27,658 | 265,571 | ..... | ..... |
| Lime.....short tons | ..... | ..... | 10,482 | 58,386 | ..... | ..... | 10,867 | 49,221 |
| Mineral waters, gallons sold | 90,189 | 14,269 | ..... | ..... | 114,416 | 19,330 | ..... | ..... |
| Phosphate rock, long tons | 2,067,507 | 8,647,774 | ..... | ..... | 2,436,248 | 9,473,638 | ..... | ..... |
| Sand and gravel, short tons | 34,858 | 21,912 | ..... | ..... | 112,776 | 33,339 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | 85,450 | ..... | ..... | ..... | 56,274 |
| Stone | ..... | [b] | ..... | [c] | ..... | ..... | ..... | [c] |
| Miscellaneous | ..... | [b] | ..... | [b] 49,379 | ..... | ..... | ..... | 135,320 |
| Total value, eliminating duplications | $9,284,705 | | | | $10,250,228 | | | |

[a] Value not included in total value.
[b] Derived product includes stone sold rough.
[c] Value included under "Miscellaneous."

## GEORGIA.

Although Georgia ranks second among all the States in the production of four mineral substances, namely, asbestos, bauxite, mineral paints, and fuller's earth, the principal values are from the outputs of the stone quarries and the clay-working industry. In the value of building stone produced, Georgia ranks first among the Southern States, and third in the value of clay products, being exceeded only by West Virginia and Texas. Georgia granites have a high reputation for building, and Georgia marbles are highly prized for structural and decorative use. The clay products are principally building brick and sewer pipe. In the production of a peculiar quality of clay used by paper makers Georgia ranks first, with a production in 1911 valued at approximately $200,000 in its raw state. In 1911 in a total value in mineral products of $6,171,367, the clay-working industries are represented by $2,859,842 and the quarrying industries by $1,967,077. In 1910 the clay-working industries produced wares to the value of $2,755,823, the quarry products were valued at $2,027,339, and the total production was valued at $6,178,429. The principal stone-producing counties are De Kalb and Elbert for granite, and Pickens for marble. The clay-working industry is most highly developed in Bibb, Fulton, Richmond, Muscogee, and Walker counties. Georgia is one of the chief sources of supply of ocher, umber, and sienna, and is fourth in the production of graphite. Two counties, Dade and Walker, in the northwest corner of the State produce high-grade bituminous coal. Bauxite, cement, coke, fuller's earth, iron ore, mineral waters, and sand and gravel are products of considerable importance, and those of minor consequence are asbestos, barytes, copper, gold, gypsum, lime, pyrite, sand-lime brick, silver, slate, and soapstone.

The statistics of the mineral production of Georgia in 1910 and 1911 are shown in the following table:

*Mineral production of Georgia in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asbestos .short tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Barytes.....do.... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Bauxite...long tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | 383,262 | $279,535 | ..... | ..... | 368,462 | $330,186 |
| Clay products, short tons..... | 66,292 | b$223,785 | ..... | 2,532,038 | 68,161 | b$223,462 | ..... | 2,636,380 |
| Coal.....short tons.. | 177,245 | 259,122 | ..... | ..... | 165,210 | 246,208 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 43,814 | b 173,049 | ..... | ..... | 37,553 | b 135,190 |
| Copper.....pounds.. | ..... | ..... | 724 | 92 | ..... | ..... | ..... | ..... |
| Fuller's earth, short tons..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Gold, fine ounces (troy)..... | ..... | ..... | 1,161 | 24,000 | ..... | ..... | 1,548 | 32,000 |
| Gypsum .short tons.. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (c) |
| Iron ore...long tons.. | 313,878 | 482,659 | ..... | ..... | 207,279 | 315,704 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | b 8,325 | b 183,132 | ..... | ..... | b 3,519 | b 52,060 |
| Lime.....short tons.. | ..... | ..... | 7,621 | 29,961 | ..... | ..... | 6,282 | 24,067 |

a Value included under "Miscellaneous."
b Value not included in total value.
c Not mined, but calcined, in Georgia. Value included under "Miscellaneous."

*Mineral production of Georgia in 1910 and 1911*—Continued.

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Mineral paints, natural pigments, short tons | ..... | ..... | 7,564 | 71,240 | ..... | ..... | 8,515 | 71,197 |
| Mineral waters, gallons sold | 734,135 | 63,171 | ..... | ..... | 981,080 | 97,752 | ..... | ..... |
| Pyrite....long tons | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons | 352,379 | 123,143 | ..... | ..... | 518,885 | 175,734 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Silver, fine ounces (troy) | ..... | ..... | 300 | 200 | ..... | ..... | 600 | 300 |
| Slate | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Stone | ..... | 1,069,076 | ..... | 958,263 | ..... | (b) | ..... | b 1,967,077 |
| Talc and soapstone, short tons | (b) | (b) | (a) | (a) | ..... | ..... | (a) | (a) |
| Miscellaneous | ..... | 235,009 | ..... | 50,920 | ..... | 226,878 | ..... | 47,884 |
| Total value, eliminating duplications | | $6,178,429 | | | | $6,171,367 | | |

a Value included under "Miscellaneous." b Derived product includes raw product.

## IDAHO.

The principal mineral products of Idaho are lead and silver, the output chiefly of the Cœur d'Alene mining district in Shoshone County. Gold, copper, and zinc are produced in small quantities. Shoshone County produces 92 per cent of the ores of precious and semiprecious metals mined in the State. Of refined lead, the chief source of mineral wealth in the State, Shoshone County produces 96 per cent; of silver it produces 92 per cent; of copper 85 per cent; and of zinc nearly 99 per cent. The total value of the metal production of Idaho, as reported by the mining companies, was $16,316,196 in 1910 and $19,100,894 in 1911, of which Shoshone County is credited with $14,416,910 in 1910 and $16,306,680 in 1911. The production of metals in Idaho as reported from the smelters, which does not make any distribution by counties, differs considerably from that reported from the mines. In 1910 the total value of the metal production in Idaho as reported by the smelters was $14,870,288; in 1911 it was $17,248,795. The total mineral production of the State, using smelter figures for the metal production, was $15,437,403 in 1910 and $17,588,340 in 1911, of which the metal production represented 96 per cent and the production of Shoshone County alone 84 per cent.

The nonmetal products, of which Idaho furnishes relatively unimportant quantities, are asbestos, clay products, coal (lignite), mineral waters, phosphate rock, pumice, salt, building stone, sand-lime brick, sand, and gravel. The deposits of phosphate rock in southeastern Idaho, which extend over into northeastern Utah and southwestern Wyoming, give promise of becoming one of the important mineral resources of that tri-State section as the agricultural industries of the Western States are developed.

The output and value of the mineral production of Idaho by substances in 1910 and 1911 are shown in the following table:

*Mineral production of Idaho in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asbestos..short tons.. | (a) | (a) | ..... | ..... | ..... | ..... | ..... | ..... |
| Clay products..do.... | (a) (b) | (a) (b) | ..... | (a) | (a) (b) | (a) (b) | ..... | (a) |
| Coal.....short tons.. | 4,448 | $17,426 | ..... | ..... | 1,805 | $4,808 | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 6,877,515 | $873,444 | ..... | ..... | 4,514,116 | $564,265 |
| Gold, fine ounces (troy)..... | ..... | ..... | 50,112 | 1,035,900 | ..... | ..... | 65,688 | 1,357,900 |
| Lead.....short tons.. | ..... | ..... | 99,924 | 8,793,312 | ..... | ..... | 117,159 | 10,544,310 |
| Lime.....do.... | ..... | ..... | 8,094 | 48,298 | ..... | ..... | 6,809 | 38,088 |
| Mineral water, gallons sold..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Phosphate rock, long tons..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Salt.....barrels.. | 350 | 386 | 535 | 741 | 71 | 120 | 243 | 412 |
| Sand and gravel, short tons..... | 32,675 | 24,450 | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Silver, fine ounces (troy)..... | ..... | ..... | 7,027,000 | 3,794,600 | ..... | ..... | 8,184,900 | 4,419,800 |
| Stone..... | ..... | (c) | ..... | c 57,277 | ..... | (c) | ..... | c 64,250 |
| Tungsten ore (60 per cent concentrates) short tons..... | ..... | ..... | ..... | ..... | ..... | ..... | (a) | (a) |
| Zinc.....short tons.. | ..... | ..... | 3,454 | 373,032 | ..... | ..... | 3,180 | 362,520 |
| Miscellaneous..... | ..... | 52,844 | ..... | 365,773 | ..... | 60,666 | ..... | 171,576 |
| Total value, eliminating duplications.. | $15,437,403 | | | | $17,588,349 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes stone sold rough.

## ILLINOIS.

Illinois ranks second or third among the States in the value of its mineral production according to whether pig iron or iron ore is taken as the basis of output and value. Illinois produces no iron ore, but its output of pig iron, derived from ores from the Lake Superior iron ranges, amounts in value to between $40,000,000 and $50,000,000 annually. The only two States whose production of pig iron exceeds Illinois are Pennsylvania and Ohio. These two States produce a small quantity of iron ore, but Illinois gets all of its raw material from Lake Superior. Pennsylvania and Ohio also secure the larger part of their ores from the same source. With pig iron as the basis, the value of the mineral output of Illinois in 1910 was $140,237,550 and in 1911 it was $137,384,382. Eliminating pig iron the values were for the two years, respectively, $98,772,007 and $106,231,455. The latter figures are considered in this summary review.

The principal raw mineral product of Illinois is coal, in which the State ranks third in the quantity produced and second in the value of the product. The value of the coal mined in Illinois in 1910 and in 1911 was considerably more than half the total value of the State's mineral output. Coal is mined in 51 counties in Illinois, just half

the total number of counties in the State. The counties accredited with the largest production are in the southern part of the State and in the southwestern part, adjacent to the city of St. Louis, though in the northern part of the State where the mines are closer to the Chicago markets large mining operations are also carried on. Two counties, St. Clair and Williamson, produce over 5,000,000 tons; two others, Madison and Sangamon, exceed 4,000,000 tons; one, Macoupin, exceeds 3,000,000 tons; two, Saline and Vermilion, exceed 2,500,000 tons; and several others produce over 1,000,000 tons. The total production of coal in Illinois in 1911 was 53,679,118 short tons, valued at $59,519,478, an increase from 45,900,246 tons, valued at $52,405,897, in 1910. Illinois is also a producer of coke, ranking fourth among the States in this respect, but at least 80 per cent of the raw coal used in the coke ovens comes from West Virginia, some Illinois coal being mixed with it.

Next to coal the principal product of Illinois is petroleum, in the production of which the State ranks third. The discovery of petroleum in quantity in Illinois is a part of the history of the last decade, a few hundred barrels being the maximum yearly output until 1905, when oil in quantity was struck. The next year, 1906, the production rose to 4,400,000 barrels; in 1907 it rose still further to over 24,000,000 barrels, and reached the maximum output of 33,686,238 barrels in 1908. The production in 1911 was 31,317,038 barrels, valued at $19,734,339, against 33,143,362 barrels, valued at $19,669,383 in 1910. The principal petroleum producing counties are Lawrence, Crawford, Clark, Clinton, Marion, and Cumberland.

Next to the fuels the clay-working industries contribute most to the mineral production of the State, with a total value of $15,176,161 in 1910 and $14,333,011 in 1911. Clay products might be made in any of the 102 counties of the State. The clay is everywhere, and the fuel is abundant and cheap. The clay-working industry is concentrated in a large measure, however, in Cook County, which contributes over one-third the total for the State. Lasalle, Knox, Vermilion, Kankakee, and Livingston counties exceed $500,000 in the value of their clay products. The principal products are building brick, vitrified brick, drain tile, and architectural terra cotta, though nearly every variety of clay product is made. According to the Thirteenth Census of the United States, Illinois ranks third in the total value of its manufactures; it ranks fourth in the manufacture of clay products. Two other industries of importance in Illinois are the manufacture of cement and quarrying. The cement plants, which are all located in the northern part of the State convenient to the Chicago market and the water transportation on Lake Michigan, had outputs valued at $4,119,012 in 1910 and $3,583,301 in 1911. Limestone is the principal quarry product, and Cook, Kankakee, Vermilion and Will counties are the leading producers.

Illinois is the leading State in the production of fluorspar, mined at Rosiclare in the southern part of the State, and second in the production of tripoli. Other mineral products of the State are glass sand and other sand, gravel, lead, lead pigments, zinc, zinc oxide, lime, mineral waters, natural gas, pyrite (a by-product in coal mining), and silver. The statistics of production in the last two years are presented in the following table:

*Mineral production of Illinois in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asphalt..short tons.. | ..... | ..... | ..... | ..... | ..... | ..... | (a) | (a) |
| Briquets, fuel..do.... | ..... | ..... | (b) | (b) | ..... | ..... | (a) (c) | (a) (c) |
| Cement, Portland,d .barrels..... | ..... | ..... | 4,459,450 | $4,119,012 | ..... | ..... | 4,582,341 | $3,583,301 |
| Clay products, short tons..... | 188,803 | c $190,896 | ..... | 15,176,161 | 182,836 | c $183,826 | ..... | 14,333,011 |
| Coal.....short tons.. | 45,900,246 | 52,405,897 | ..... | ..... | 53,679,118 | 59,519,478 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 1,514,504 | c6,712,550 | ..... | ..... | (a) (c) | (a) (c) |
| Ferro-alloys, long tons..... | ..... | ..... | (a) (c) | (a) (c) | ..... | ..... | (a) (c) | (a) (c) |
| Fluorspar, short tons. | 47,302 | 277,764 | ..... | ..... | 68,817 | 481,635 | ..... | ..... |
| Gypsum.....do.... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (e) |
| Iron, pig..long tons.. | ..... | ..... | 2,606,335 | c41,465,543 | ..... | ..... | 2,036,081 | c31,152,927 |
| Lead.....short tons.. | ..... | ..... | 262 | 23,056 | ..... | ..... | 308 | 27,720 |
| Lime.....do.... | ..... | ..... | 113,239 | 503,581 | ..... | ..... | 92,169 | 423,762 |
| Mineral paints, zinc-lead pigments, short tons..... | ..... | ..... | (a) | (a) | ..... | ..... | ..... | ..... |
| Mineral waters, gallons sold..... | 1,117,620 | 83,148 | ..... | ..... | 1,304,950 | 82,330 | ..... | ..... |
| Natural gas..... | ..... | 613,642 | ..... | ..... | ..... | 687,726 | ..... | ..... |
| Petroleum...barrels.. | 33,143,362 | 19,669,383 | ..... | ..... | 31,317,038 | 19,734,339 | ..... | ..... |
| Pyrite....long tons.. | 8,541 | 28,159 | ..... | ..... | 17,441 | 47,020 | ..... | ..... |
| Sand and gravel. short tons..... | 8,586,508 | 1,730,795 | ..... | ..... | 8,488,683 | 1,990,922 | ..... | ..... |
| Silver, fine ounces, (troy)..... | ..... | ..... | 2,000 | 1,100 | ..... | ..... | 4,000 | 2,200 |
| Stone..... | ..... | 1,213,317 | ..... | 2,640,108 | ..... | (f) | ..... | f3,467,930 |
| Sulphuric acid (60° Baumé),g short tons..... | ..... | ..... | ..... | (b) | ..... | ..... | 144,805 | 958,591 |
| Tripoli..... | ..... | ..... | ..... | 33,390 | ..... | ..... | ..... | 45,910 |
| Zinc.....short tons.. | ..... | ..... | 1,551 | 167,508 | ..... | ..... | 2,884 | 328,776 |
| Miscellaneous..... | ..... | ..... | ..... | 1,560,547 | ..... | ..... | ..... | 7,756,705 |
| Total value, eliminating duplications.. | $98,772,007 | | | | $106,231,455 | | | |

a Value included under "Miscellaneous."
b No report for 1910.
c Value not included in total value.
d Natural cement included under "Miscellaneous."
e Not mined, but calcined, in Illinois. Value included under "Miscellaneous."
f Derived product includes stone sold rough.
g From zinc smelters.

## INDIANA.

Indiana ranks fifteenth among the States in the value of its mineral production, with a total in 1911 of $37,430,187. In 1910 the value of the mineral products aggregated $44,904,701. These values are exclusive of pig iron, which in the last two years, because of the operations of the United States Steel Corporation at Gary, has become an important industry in the State. If pig iron be included, the value of the mineral production would show an increase of about 30 per cent over the figures given for 1910 and 34 per cent over those for 1911. The principal mineral product of the State is coal, in the production of which Indiana ranked fifth among the States in 1910 and sixth in 1911. Indiana's coal production in 1910, owing to the prolonged strike among the miners in Illinois, reached its highest record, with an output of 18,389,815 short tons, valued at $20,813,659, decreasing in 1911 to 14,201,355 short tons, valued at

$15,326,808. In 1910 the coal production represented 45 per cent of the State's total; in 1911 it represented 41 per cent. The coal production of Indiana in 1910 was nearly 10 times what it was in 1882. The three principal coal-producing counties are Green, Sullivan, and Vigo, each of which has exceeded 3,000,000 tons a year, and the last two in 1910 produced over 4,000,000 tons. Only three other counties—Clay, Knox, and Vermilion—have produced as much as 1,000,000 tons a year. Next to coal mining the clay-working industries are the most important, Indiana in this respect having the same rank as in coal. The value of the clay products amounted to $8,100,010 in 1910 and to $7,000,771 in 1911. The leading counties in the manufacture of clay products are Clay, Lake, Madison, Vigo, Parke, Vermilion, Marion, and Morgan. The principal clay products are drain tile, common brick, and encaustic tile. In the manufacture of encaustic tile Indiana ranks third among the States. Third in importance among the mining industries of the State is the manufacture of Portland cement, in which Indiana ranks second among the States in the quantity produced, being exceeded only by Pennsylvania. In value Indiana's production falls below California. In 1910 the production of Portland cement in Indiana amounted to 7,219,199 barrels, valued at $6,487,508, and in 1911 it was 7,407,830 barrels, valued at $5,937,241. The centers of cement production are Stroh and Syracuse in the northern part of the State, and Mitchell and Speeds in the southern part. The quarry products rank fourth in the value of output, the value of the stone produced in 1911 amounting to $4,413,655, against $4,476,382 in 1910. "Bedford" limestone quarried in Lawrence and Monroe counties is highly prized for structural purposes and forms the principal stone product of the State.

Since the completion in 1911 of the plant of Koppers by-product coke ovens by the United States Steel Corporation at Gary Indiana has assumed importance as a manufacturer of coke, ranking sixth among the States in that year. The coal for these ovens is, however, like most of that consumed in Illinois, drawn from West Virginia mines. Petroleum, in which Indiana ranks ninth, and natural gas, in which it ranks seventh, add about $3,000,000 to the State's mineral output. Other mineral products are lime, mineral waters, oilstones, sand-lime brick, pyrite, sand, and gravel, as shown in the following table:

*Mineral production of Indiana in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (d) | (b) (d) |
| Cement, Portland, c barrels | ..... | ..... | 7,219,199 | $6,487,508 | ..... | ..... | 7,407,830 | $5,937,241 |
| Clay products, short tons | 88,176 | b $80,829 | ..... | 8,100,010 | 61,992 | b $54,918 | ..... | 7,000,771 |
| Coal...short tons | 18,389,815 | 20,813,659 | ..... | ..... | 14,201,355 | 15,326,808 | ..... | ..... |
| Coke.....do | ..... | ..... | b 84,046 | b 269,315 | ..... | ..... | (b) (d) | (b) (d) |
| Gems and precious stones | ..... | ..... | ..... | 100 | ..... | ..... | ..... | 20 |
| Iron, pig, long tons | ..... | ..... | b 830,938 | b12,879,539 | ..... | ..... | b 851,485 | b12,772,275 |
| Lime...short tons | ..... | ..... | 86,811 | 301,304 | ..... | ..... | 92,229 | 324,950 |
| Mineral paints, natural pigments, short tons | ..... | ..... | ..... | ..... | ..... | ..... | (d) | (d) |
| Mineral waters, gallons sold | 754,111 | 514,958 | ..... | ..... | 1,084,428 | 653,641 | ..... | ..... |
| Natural gas | ..... | 1,473,403 | ..... | ..... | ..... | 1,192,418 | ..... | ..... |
| Oilstones | ..... | ..... | ..... | (d) | ..... | ..... | ..... | 18,151 |
| Petroleum, barrels | 2,159,725 | 1,568,475 | ..... | ..... | 1,695,289 | 1,228,835 | ..... | ..... |
| Pyrite..long tons | (d) | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Sand and gravel, short tons | 6,418,468 | 1,045,162 | ..... | ..... | 6,033,159 | 1,133,829 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | 63,534 | ..... | ..... | ..... | 45,891 |
| Stone | ..... | 1,412,372 | ..... | 3,064,010 | ..... | (e) | ..... | e4,413,655 |
| Sulphuric acid (60° Baumé), f short tons | ..... | ..... | ..... | (a) | ..... | ..... | (f) | (f) |
| Miscellaneous | ..... | (e) | ..... | e 329,521 | ..... | (e) | ..... | e 3,779,172 |
| Total value, eliminating duplications. | $44,904,701 | | | | $37,430,187 | | | |

a No report for 1910.
b Value not included in total value.
c Natural cement included under "Miscellaneous."
d Value included under "Miscellaneous."
e Derived product includes raw product.
f From zinc smelters. Value included under "Miscellaneous."

## IOWA.

The total value of the mineral products of Iowa was $21,107,496 in 1911, against $22,730,968 in 1910. Coal mining and clay working are the principal industries, these two contributing 85 per cent of the total value. Coal is mined in 21 different counties, of which the principal ones are, in order, Monroe, Polk, Appanoose, and Mahaska. The coal-mining operations are chiefly on a moderate scale, there being but 25 mines in the State having an output in excess of 100,000 tons; and although Iowa was probably the second State west of Mississippi River in priority as a coal producer (production dating back to 1840), the industry in this State has not shown the same progress as in many other States east or west of that boundary. The production of coal in Iowa in 1911 was less than double that of 1882, whereas the total production of coal in the Western States in 1911 was about 10 times that of 1882. The reason for this probably lies in the fact that Iowa is largely an agricultural State and manufactures have not been extensively developed. The State ranks eighteenth in the value of its manufactures and twentieth in the value of its mineral output. The coal production of the State amounted

to 7,331,648 short tons, valued at $12,663,507, in 1911, against 7,928,120 tons, valued at $13,903,913, in 1910.

The clay-working industries, in which Iowa ranks eighth among the States, produced wares to the value of $5,328,241 in 1910 and $4,432,874 in 1911. The principal products are drain tile, in which Iowa holds first place among the States, and common brick. The principal producing counties are Webster, Cerro Gordo, Polk, and Woodbury. The branch of the mining industry in which Iowa ranks relatively highest is in the production of gypsum. In this respect Iowa holds second place among the States, and the value of the gypsum products is third in importance in the State's total, amounting in 1910 to $943,849 and in 1911 to $871,752. The other commercial mineral products are stone, lime, mineral pigments, mineral waters, sand-lime brick, cement, natural gas, sand, and gravel. The production of the different minerals in 1910 and 1911 as far as they may be published separately was as follows:

*Mineral production of Iowa in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Cement.....barrels | ..... | ..... | (c) | (c) | ..... | ..... | 1,952,590 | $1,881,253 |
| Clay products, short tons | 12,640 | b $5,153 | ..... | $5,328,241 | 9,643 | b $3,965 | ..... | 4,432,874 |
| Coal.....short tons | 7,928,120 | 13,903,913 | ..... | ..... | 7,331,648 | 12,663,507 | ..... | ..... |
| Gypsum .....do | 322,713 | ..... | ..... | 943,849 | 354,204 | ..... | ..... | 871,752 |
| Lime .....do | ..... | ..... | 15,481 | 81,775 | ..... | ..... | 14,791 | 80,914 |
| Mineral paints, natural pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Mineral waters, gallons sold | 253,100 | 27,175 | ..... | ..... | 176,000 | 20,500 | ..... | ..... |
| Natural gas | ..... | 40 | ..... | ..... | ..... | 70 | ..... | ..... |
| Sand and gravel, short tons | 1,798,762 | 464,427 | ..... | ..... | 1,349,004 | 393,649 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | 31,269 | ..... | ..... | ..... | (c) |
| Stone | ..... | 186,680 | ..... | 371,376 | ..... | (d) | ..... | d 736,207 |
| Zinc.....short tons | ..... | ..... | 40 | 4,320 | ..... | ..... | ..... | ..... |
| Miscellaneous | ..... | ..... | ..... | 1,387,903 | ..... | ..... | ..... | 27,970 |
| Total value, eliminating duplications | $22,730,968 | | | | $21,107,496 | | | |

a No report for 1910.
b Value not included in total value.
c Value included under "Miscellaneous."
d Derived product includes stone sold rough.

## KANSAS.

The principal mineral products of Kansas are the two fuels, coal and natural gas. Some petroleum is produced, but the quantity and the value of the output are relatively small. The value of the coal and gas considerably exceeds 50 per cent of the State's total in mineral production. The coal productive area is entirely in the eastern part of the State, and the two leading coal-producing counties, Cherokee and Crawford (credited with 90 per cent of the total), are in the extreme southeast corner. The principal counties in the production of natural gas are Chautauqua and Montgomery, also in the south-

eastern part of the State. The development of the gas resources of Kansas is largely a part of the history of the last decade, for although some gas was produced in the State as early as 1886, it did not assume any importance until 1901, when the value amounted to $660,000. In 1911 the value of the natural gas produced in Kansas was $4,854,534. It reached its highest point in 1909, when the output was valued at $8,293,846. The deficiency in 1911 was made up from gas drawn from Oklahoma. Coal production in Kansas began in 1869. In 1882, the first year for which Mineral Resources was published, the production was estimated at 750,000 tons. The maximum production was attained in 1907, with an output of 7,322,449 tons. In 1910 coal production in Kansas, as in other Mississippi Valley States, was seriously curtailed by the miners' strike, and amounted to only 4,921,451 tons, from which recovery to 6,254,228 tons was made in 1911.

The total value of the mineral production of Kansas was $28,304,191 in 1910 and $24,987,807 in 1911, the distribution by substances being as follows:

*Mineral production of Kansas in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Cement, Portland,[a] barrels | ..... | ..... | 5,655,808 | $5,359,408 | ..... | ..... | 4,871,903 | $3,725,108 |
| Clay products | ..... | ..... | ..... | [b]2,661,527 | ..... | ..... | ..... | [b]2,360,262 |
| Coal.....short tons | 4,921,451 | $7,914,709 | ..... | ..... | 6,254,228 | $9,645,572 | ..... | ..... |
| Coke.....do | ..... | ..... | (c) (d) | (c) (d) | ..... | ..... | (c) (d) | (c) (d) |
| Gypsum.....do | 135,088 | ..... | ..... | 370,695 | 122,579 | ..... | ..... | 319,504 |
| Lead.....do | ..... | ..... | 1,308 | 115,104 | ..... | ..... | 2,522 | 226,980 |
| Lime.....do | ..... | ..... | 1,510 | 7,503 | ..... | ..... | 648 | 3,440 |
| Mineral paints, zinc-lead pigments, short tons | ..... | ..... | (d) | (d) | ..... | ..... | (d) | (d) |
| Mineral waters, gallons sold | 591,004 | 82,307 | ..... | ..... | 456,341 | 63,063 | ..... | ..... |
| Natural gas | ..... | 7,755,367 | ..... | ..... | ..... | 4,854,534 | ..... | ..... |
| Petroleum...barrels | 1,128,668 | 444,763 | ..... | ..... | 1,278,819 | 608,756 | ..... | ..... |
| Pumice..short tons | (d) | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Salt.....barrels | 1,338,357 | 266,058 | 1,473,091 | 681,311 | 769,691 | 197,361 | 1,390,168 | 608,666 |
| Sand and gravel, short tons | 776,638 | 165,659 | ..... | ..... | 734,507 | 164,058 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (d) | ..... | ..... | ..... | (d) |
| Stone | ..... | 121,583 | ..... | 672,847 | ..... | (e) | ..... | e 803,222 |
| Sulphuric acid (60° Baumé) f, short tons | ..... | ..... | ..... | (f) | ..... | ..... | (f) | (f) |
| Zinc.....short tons | ..... | ..... | 10,220 | 1,103,760 | ..... | ..... | 6,843 | 780,102 |
| Miscellaneous | ..... | (e) | ..... | e 582,590 | ..... | (e) | ..... | e 629,104 |
| Total value, eliminating duplications | $28,304,191 | | | | $24,987,807 | | | |

a Natural cement included under "Miscellaneous."
b Exclusive of pottery, which is included under "Miscellaneous."
c Value not included in total value.
d Value included under "Miscellaneous."
e Derived product includes raw product.
f From zinc smelters. No report for 1910. Value included under "Miscellaneous."

The development of the gas pools of Kansas and Oklahoma has built up another important industry in Kansas—the manufacture of cement. The output of the cement works ranks third in value among

the mineral products of the State, and Kansas ranks fourth among the States in the quantity and value of cement produced. The cement plants are, with two exceptions, in the southeastern corner of the State, the largest activity being in the vicinity of Independence, in Montgomery County. The production of cement in Kansas decreased from 5,655,808 barrels, valued at $5,359,408, in 1910, to 4,871,903 barrels, valued at $3,725,108, in 1911.

Natural gas has also influenced the clay-working industry in Kansas, but chiefly in lowering the cost of manufacture. The clay products of Kansas, exclusive of pottery, were valued at $2,661,527 in 1910 and at $2,360,262 in 1911. The principal product from the clay-burning kilns is vitrified brick, in the production of which Kansas ranks fourth among the States. The average price of this brick in Kansas in 1911 was $9.88 per thousand, a lower average than in any State except Arkansas for the year. Common brick is second among the clay products, the output in 1911 being valued at $694,586, at the average rate of $3.78 per thousand, the lowest average price for this class of clay product in the United States. The principal clay-producing counties are Montgomery, Crawford, and Wilson.

Other important industries in Kansas are zinc mining, salt mining and evaporating, stone quarrying, and the mining and calcining of gypsum. In the production of salt Kansas ranks fourth among the States, and in the mining of zinc it stands sixth. Less important mineral products of Kansas are lead, lime, mineral waters, sand and gravel, pumice, sand-lime brick, and zinc and lead pigments.

## KENTUCKY.

The principal mineral product of Kentucky is coal, the value of which constitutes about two-thirds of the State's total. In 1910 the total value of Kentucky's mineral production was $19,883,476, of which the coal output made up $14,405,887, and in 1911 out of $18,910,731 the coal mines contributed $13,617,217. The coal-producing areas of Kentucky are found in the extreme eastern counties and in the more northern counties in the western part of the State. The coal beds in the eastern part of the State belong to the Appalachian system, whereas those in the western part of the State belong to the eastern interior field, the larger part of which lies across Ohio River in Illinois and Indiana on the north. The production has been nearly evenly divided between the two sections, the western areas having somewhat the better of it up to the close of 1911. The supremacy of the western counties has, however, about ceased, as extensive developments are in progress in Pike, Johnson, and other counties in the eastern part of the State, following the extension of branches of several railroad systems into those counties, and the next few years will record substantial increases from that section. At the present time Bell, Whitley, Knox, and Johnson counties are the largest producers in the eastern part of the State, and Muhlenberg, Hopkins, Webster, Ohio, and Union counties are the principal producers in the western part of the State. In 1911 the coal production of Kentucky was 13,706,839 short tons, of which the eastern counties produced 6,595,102 tons and the western counties 7,111,737 tons. Coal mining in Kentucky began in the third decade of the last century, and so far as known Kentucky was the third State to enter

the list of coal producers, but it was not until the State began to recover from the effects of the Civil War that coal mining became an industry of any importance. Up to 1875 the production in any one year had not amounted to half a million tons, but the census of 1880 showed an output of 946,288 tons. In 1882 the production was estimated at 1,300,000 tons, about one-tenth that of the present time.

The clay-working industry is second in importance in the State, with from 12 to 15 per cent of the total value. The principal clay products are firebrick and common brick, and the principal producing counties are Jefferson, Carter, Kenton, and Boyd. The clay products in 1910 were valued at $2,567,537, and in 1911 they were valued at $2,368,094.

The statistics of the mineral production in 1910 and 1911, by substances, as far as they can be published separately, are given in the following table:

*Mineral production of Kentucky in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asphalt..short tons.. | 9,938 | $53,703 | 1,287 | $12,226 | (a) | (a) | (a) | (a) |
| Barytes.....do.... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons..... | 80,420 | b 85,655 | ..... | 2,567,537 | 131,801 | b $126,457 | ..... | $2,368,094 |
| Coal.....do.... | 14,623,319 | 14,405,887 | ..... | ..... | 13,706,839 | 13,617,217 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 53,857 | b 120,554 | ..... | ..... | 66,099 | b 134,862 |
| Ferro-alloys, long tons..... | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Fluorspar.short tons.. | 17,003 | 124,574 | ..... | ..... | 12,403 | 96,574 | ..... | ..... |
| Iron ore...long tons.. | 51,193 | 63,066 | ..... | ..... | 63,770 | 78,212 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | 81,677 | b1,312,288 | ..... | ..... | 57,982 | b 870,542 |
| Lead.....short tons.. | ..... | ..... | 50 | 4,400 | ..... | ..... | ..... | ..... |
| Lime.....do.... | ..... | ..... | 3,622 | 12,468 | ..... | ..... | 4,365 | 15,121 |
| Mineral paints, natural pigments, short tons..... | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Mineral waters, gallons sold..... | 403,736 | 55,195 | ..... | ..... | 423,729 | 49,827 | ..... | ..... |
| Natural gas..... | ..... | 456,293 | ..... | ..... | ..... | 407,689 | ..... | ..... |
| Oilstones..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (a) |
| Petroleum...barrels.. | 468,774 | 324,684 | ..... | ..... | 472,458 | 328,614 | ..... | ..... |
| Phosphate rock, long tons..... | ..... | ..... | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons..... | 737,350 | 386,446 | ..... | ..... | 906,905 | 389,568 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Silver, fine ounces (troy)..... | ..... | ..... | (a) | (a) | ..... | ..... | ..... | ..... |
| Stone..... | ..... | (c) | ..... | c1,073,588 | ..... | (c) | ..... | c1,227,609 |
| Zinc.....short tons.. | ..... | ..... | 29 | 3,132 | ..... | ..... | 205 | 23,370 |
| Miscellaneous..... | ..... | (c) | ..... | 800,277 | ..... | 35,095 | ..... | 704,779 |
| Total value, eliminating duplications..... | $19,883,476 | | | | $18,910,731 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

The quarrying industry is third in importance and is confined to the production of limestone, most of which is crushed for road making, railroad ballast, and concrete. The principal producing counties are Fayette, Jefferson, Jessamine, Rock Castle, Warren, and

Caldwell. The total production of stone in 1911 was valued at $1,227,609, against $1,073,588 in 1910. Natural gas was produced to the value of $456,293 in 1910 and of $407,689 in 1911, and petroleum to the value of $324,684 in 1910 and of $328,614 in 1911 was produced in Barren, Bath, Floyd, Knott, Logan, Rowan, Wayne, and Wolf counties. Kentucky is second among the States in the production of fluorspar and third in the production of barytes. The former is mined in Crittenden and Livingston counties and the latter in Boyle, Fayette, Garrard, and Lincoln counties. Other mineral products of the State are asphalt, cement, iron ore, lead, lime, mineral waters, mineral paints, oilstones, phosphate rock, sand and gravel, sand-lime brick, silver, and zinc. A small quantity of lithographic stone was quarried at Brandenburg in 1911.

## LOUISIANA.

It is only during the last 10 years that Louisiana has attained any prominence as a mineral-producing State. Following the sensational strike of oil at Beaumont, Tex., in 1901, prospecting for petroleum was actively carried on across Sabine River in Louisiana, resulting in the discovery and development of several pools in the vicinity of Jennings. Since that time productive areas have been developed in many parts of the State, and Louisiana now ranks eighth among the States in the production of petroleum. The Caddo district, opened in 1906, is the principal producer at the present time and of greatest promise for the future. It is located in Caddo Parish in the northwestern part of the State, about 200 miles from the place of original discovery of oil near Jennings. The production of petroleum in Louisiana amounted to 6,841,395 barrels, valued at $3,574,069, in 1910, and to 10,720,420 barrels, valued at $5,668,814, in 1911.

In one respect Louisiana stands preeminently first among the States. This is in the production of sulphur. In 1904 the Frasch process for the recovery of sulphur from beds lying under a heavy cover of quicksand was put into successful operation by the Union Sulphur Co. at Sulphur City, about 12 miles west of Lake Charles, in Calcasieu Parish. Since that time approximately 1,000,000 tons of refined sulphur have been recovered. Prior to this the only domestic source of sulphur in quantity in the United States was iron pyrites, from which sulphuric acid is made direct. Nearly all the sulphur used was imported from Sicily. At the present time the domestic output of refined sulphur, except that from Louisiana, is a negligible quantity. The imports of sulphur into the United States in 1903 were valued at $3,709,690; in 1911 they were valued at $552,836.

In addition to petroleum and sulphur Louisiana is an important producer of rock salt, in which the State also ranks first. The salt mines underlie so-called "islands," really mounds rising above the marshlands along the Gulf shore in Iberia Parish. The Petite Anse mines on Avery Island were operated during the Civil War, having been developed in a small way in 1862. This mine was flooded twice, and a new shaft was sunk in 1899. Mining on Weeks Island was begun in 1902. In the total production of salt, including that evaporated from brine, Louisiana ranks sixth among the States.

Louisiana's clay products, exclusive of pottery, were valued at $546,873 in 1910 and at $531,949 in 1911. The principal clay product is common brick. The other mineral products are mineral waters, natural gas, pottery, stone, sand, and gravel.

The production of the State in 1910 and 1911 is shown in the following table:

*Mineral production of Louisiana in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products | ..... | ..... | ..... | [a] $546,873 | ..... | ..... | ..... | [a] $531,949 |
| Mineral waters, gallons sold | 2,313,000 | $163,975 | ..... | ..... | 1,520,550 | $110,998 | ..... | ..... |
| Natural gas | ..... | (b) | ..... | ..... | ..... | (b) | ..... | ..... |
| Petroleum...barrels | 6,841,395 | 3,574,069 | ..... | ..... | 10,720,420 | 5,668,814 | ..... | ..... |
| Salt.....do | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Sand and gravel, short tons | 835,295 | 372,336 | ..... | ..... | 969,259 | 344,281 | ..... | ..... |
| Stone | ..... | (c) | ..... | (b) | ..... | (c) | ..... | (b) |
| Sulphur...long tons | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Miscellaneous | ..... | 5,423,516 | ..... | 39,224 | ..... | 5,953,897 | ..... | 101,019 |
| Total value, eliminating duplications | $10,119,993 | | | | $12,710,958 | | | |

[a] Exclusive of pottery, which is included under "Miscellaneous."
[b] Value included under "Miscellaneous."
[c] Derived product includes stone sold rough.

## MAINE.

The total value of the mineral production of Maine is less than $5,000,000, and it ranks thirty-ninth as a mining State, but in one mineral product, feldspar, it holds first place. Feldspar is mined in Androscoggin, Oxford, and Sagadahoc counties. In 1911 Maine produced 24 per cent of the quantity and 42 per cent of the value of the feldspar produced in the United States. The principal mineral product of the State, however, is granite, in the production of which Maine ranks second among the States, being exceeded only by Vermont. Approximately one-half of the total value of the mineral production of Maine is represented by the output of its granite quarries, which are located in Franklin, Hancock, Kennebec, Knox, and Waldo counties. The stone production was valued at $2,320,018 in 1910 and at $2,263,200 in 1911. Maine is also one of the three leading States in the production of slate, quarried in Piscataquis County, and it ranks fourth among the States in the production of lime, the value of which in 1910 was $893,599, and in 1911, $773,212. The other commercial mineral products are manufactures from clay, including pottery, gems (intermittently), mineral waters, sand, and gravel.

The production of minerals in Maine during 1910 and 1911 is shown in the following table:

*Mineral production of Maine in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products | | | | $605,881 | | | | $625,214 |
| Feldspar, short tons | 20,762 | $196,463 | | | 25,976 | $246,305 | | |
| Gems and precious stones | | | | 3,305 | | | | 12,355 |
| Lime, short tons | | | 179,656 | 893,599 | | | 152,552 | 773,212 |
| Mineral waters, gallons sold | 1,238,171 | 404,539 | | | 1,254,783 | 431,740 | | |
| Sand and gravel, short tons | 41,569 | 40,313 | | | 33,308 | 30,088 | | |
| Slate | | | | 249,005 | | | | 263,516 |
| Stone | | (a) | | a2,320,018 | | (a) | | a2,263,200 |
| Total value, eliminating duplications | $4,713,123 | | | | $4,645,630 | | | |

a Derived product includes stone sold rough.

## MARYLAND.

Exclusive of pig iron, the value of the mineral production of Maryland was $10,238,488 in 1910 and $9,386,663 in 1911. If pig iron, most of which is from ore mined in other States or from ore imported from foreign countries, be included, the value of the product would be increased approximately 50 per cent.

The principal mineral product of Maryland is coal, mined in Allegany and Garrett counties in the western part of the State. The value of the output of the coal mines approximates one-half the value of the State's total. Coal mining in Maryland began early in the last century, the first coal being shipped by barges on Potomac River as early as 1830. Mining had begun, however, 10 or 12 years earlier. The first company was incorporated in 1836. The "Big Vein" of Maryland, from which most of the coal has been produced, is approaching exhaustion, and operations in the future will be chiefly in the smaller and deeper beds. The industry has remained practically stationary during the last 10 years. The production in 1911 was 4,685,795 short tons, and the average for the 10 years ending with 1910 was 4,973,860 tons.

Next to coal the clay-working industry is the most important branch of mining in Maryland, 18 per cent of the total value being from the clay pits. The principal clay product is building brick, and the principal producing locality is in the vicinity of Baltimore. Third in importance are the quarries, which yield 10 per cent of the total value. The principal stone quarried is granite, the quarries being located in Cecil, Harford, Howard, Montgomery, and Baltimore counties and in Baltimore City. Other commercial mineral products are feldspar, cement, copper, iron ores, lime, mineral pigments, mineral waters, infusorial earth, quartz, slate, sand-lime brick, talc, sand, and gravel.

The quantity and value of the minerals produced in Maryland during 1910 and 1911 are shown in the following table:

*Mineral production of Maryland in 1910 and 1911.*

| Product. | 1910. | | | | 1911. | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Cement.....barrels | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Clay products, short tons | 22,696 | b $46,143 | ..... | $1,848,273 | 12,323 | b $28,123 | ..... | $1,772,434 |
| Coal.....short tons | 5,217,125 | 5,835,058 | ..... | ..... | 4,685,795 | 5,197,066 | ..... | ..... |
| Coke.....do | ..... | ..... | (b) (c) | (b) (c) | ..... | ..... | (b) (c) | (b) (c) |
| Copper.....pounds | ..... | ..... | ..... | ..... | ..... | ..... | 23,555 | 2,944 |
| Feldspar, short tons | 9,977 | 47,340 | ..... | ..... | 12,694 | 56,265 | ..... | ..... |
| Infusorial earth | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (c) |
| Iron ore...long tons | 14,062 | 29,105 | ..... | ..... | (c) | (c) | ..... | ..... |
| Iron, pig.....do | ..... | ..... | b 326.214 | b5,230,824 | ..... | ..... | b 222,420 | b3,467,789 |
| Lime.....short tons | ..... | ..... | 121,555 | 377,236 | ..... | ..... | 114,386 | 362,839 |
| Mineral paints, natural pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Mineral waters, gallons sold | 1,163,828 | 102,371 | ..... | ..... | 1,657,756 | 150,966 | ..... | ..... |
| Quartz...short tons | 8,614 | 50,410 | ..... | ..... | 7,977 | 34,286 | ..... | ..... |
| Sand and gravel, short tons | 954,393 | 396,357 | ..... | ..... | 482,152 | 246,486 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (c) |
| Slate | ..... | ..... | ..... | 78,573 | ..... | ..... | ..... | 76,035 |
| Stone | ..... | (d) | ..... | d1,205,761 | ..... | (d) | ..... | d1,133,339 |
| Talc and soapstone, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Miscellaneous | ..... | ..... | ..... | 1,607,877 | ..... | (d) | ..... | d1,704,217 |
| Total value, eliminating duplications | $10,238,488 | | | | $9,386,663 | | | |

a No report for 1910.
b Value not included in total value.
c Value included under "Miscellaneous."
d Derived product includes raw product.

## MASSACHUSETTS.

The principal mineral products of Massachusetts are stone and clay. About one-half the total value of the mineral production is furnished by the stone quarries, exclusive of limestone burned into lime. The clay products furnish from 25 to 30 per cent of the total, and lime adds from 10 to 15 per cent. Approximately one-half of the quarry product is granite, of which the principal producing counties are Bristol, Essex, Middlesex, Norfolk, and Worcester. The production of trap rock in Essex, Hampden, Middlesex, Norfolk, and Suffolk counties yields values about half that of granite, and the other fourth is made up by sandstone and marble in the proportion of two to one. Sandstone is quarried in Hampden and Suffolk counties, and marble in Berkshire and Hampden counties. The principal clay products are common brick and brick for stove lining, and the principal producing counties are Bristol, Middlesex, Hampden, Suffolk, and Essex. The lime industry is independent of the marble quarries and is located chiefly in Berkshire County in the extreme western part of the State. Massachusetts ranks sixth among the States in the manufacture of lime; it is eighth in the total production of stone. Other products to which the State contributes are fuller's

earth, mineral waters, talc and soapstone, feldspar, sand and gravel, infusorial earth, mica, pyrite, and quartz. A small quantity of iron ore is mined and a small quantity of pig iron is produced in the State. The total value of the mineral production of Massachusetts in 1911 was $6,623,077, against $5,903,976 in 1910. The quarry products were valued at $2,870,640 in 1910 and at $3,691,747 in 1911; the clay products at $1,707,413 in 1910 and at $1,700,287 in 1911. Lime, the third item of importance, was valued at $758,739 in 1910 and at $695,662 in 1911.

The distribution of the mineral production of Massachusetts by substances in 1910 and 1911 was as follows:

*Mineral production of Massachusetts in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | 1,922 | a $2,985 | ..... | $1,707,413 | 1,187 | a $2,972 | ..... | $1,700,287 |
| Coke.....short tons | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Emery.....do | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Feldspar.....do | (b) | (b) | ..... | ..... | ..... | ..... | ..... | ..... |
| Fullers' earth..do | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Gems and precious stones | ..... | ..... | ..... | 280 | ..... | ..... | ..... | 850 |
| Infusorial earth | ..... | ..... | ..... | (b) | ..... | ..... | ..... | (b) |
| Iron ore...long tons | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Iron, pig.....do | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Lime.....short tons | ..... | ..... | 140,942 | 758,739 | ..... | ..... | 137,440 | 695,662 |
| Mica | ..... | ..... | ..... | (b) | ..... | ..... | ..... | ..... |
| Mineral waters, gallons sold | 4,691,159 | 241,949 | ..... | ..... | 4,610,474 | 218,870 | ..... | ..... |
| Pyrite.....long tons | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Quartz...short tons | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Sand and gravel, short tons | 321,860 | 212,716 | ..... | ..... | 374,326 | 222,822 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (b) |
| Stone | ..... | (c) | ..... | c2,870,640 | ..... | (c) | ..... | c3,691,747 |
| Talc and soapstone, short tons | ..... | ..... | 7,475 | 52,204 | (c) | (c) | c 7,642 | c 36,883 |
| Miscellaneous | ..... | 59,690 | ..... | 1,475,109 | ..... | 51,441 | ..... | 1,521,341 |
| Total value, eliminating duplications | $5,903,976 | | | | $6,623,077 | | | |

a Value not included in total value.
b Value included under "Miscellaneous."
c Derived product includes raw product.

## MICHIGAN.

Michigan ranks second among the States in the production of iron ore, being exceeded by Minnesota; first in the production of salt, with New York second; second in the production of grindstones, with Ohio first. Michigan outranks all the other States in the production of sand-lime brick, ranks third in the production of copper, and fourth in the production of gypsum. With iron ore as the basis of iron production, Michigan ranks sixth among the States in the value of mineral output, which for Michigan in 1910 amounted to $83,581,377 and in 1911 to $65,077,232. Of these totals, the iron-ore production represented $41,393,585 in 1910 and $23,808,935 in 1911, the slump in the iron trade in 1911 being exhibited in Michigan

by a decrease in ore production of 4,359,513 long tons, or 32.77 per cent, in quantity, and of $17,584,650, or 42.48 per cent, in value. The iron ores of Michigan, as of the other two States included in the Lake Superior region (Minnesota and Wisconsin), are hematites of Bessemer grade. They occur in the Marquette range, all of which is in Michigan, and the Menominee and Gogebic ranges, the larger portions of which are in Michigan and smaller portions in Wisconsin. The principal producing counties are Marquette, Iron, Gogebic, and Dickinson; a relatively small quantity comes from Baraga County.

In 1882, the first year for which the volume of Mineral Resources was published, the Marquette and Menominee ranges were the only ones opened in the Lake Superior region. The production in that year was a little short of 3,000,000 long tons, most of which was from Michigan. The Crystal Falls and Iron River ranges began production in 1882, the first year covered by this review. These ranges are not as important producers as the better known ranges, but each one is still turning out over a million tons yearly. The Gogebic range was opened in 1884, as was the Vermillion range in Minnesota. The Mesabi range in Minnesota, now the greatest iron producer of the world, was opened in 1892, but Michigan continued to lead in the production of ore until the first year of the present century, its supremacy ceasing with 1900. At the present time two-thirds of the iron-ore production of the Lake Superior region is from the Mesabi range in Minnesota. A special chapter on the iron-ore reserves of Michigan, by C. K. Leith, is published in the present volume of Mineral Resources.

Next to iron ore in the value of Michigan's mineral production is copper, this metal furnishing nearly 34 per cent of the total value in 1910 and 42 per cent in 1911. Out of a total production of 1,097,232,749 pounds of copper, valued at $137,154,092 for the United States in 1911, Michigan produced 218,185,236 pounds, valued at $27,273,155. In 1910 Michigan produced 221,462,984 pounds out of a total of 1,080,159,509 pounds. "Lake" copper, as the output of Michigan is called, is largely native and is considered for some purposes superior to "electrolytic" copper. It usually sells about one-fourth cent a pound above other coppers. The mining of copper in Michigan is of prehistoric origin, the metal being used by the North American Indians before the advent of white men. Records since 1810 show that the total production of copper from that date to the close of 1911 has amounted to approximately 5,000,000,000 pounds, or about 30 per cent of the total output of the United States. The annual production at the present time is about four times what it was in 1882.

Michigan stands well up among the States in the manufacture of cement, the production amounting to 3,686,716 barrels in 1911 and 3,687,719 barrels in 1910. There were 11 cement mills in operation in 1911, all but one of them in the southern half of the Lower Peninsula. In the production of salt Michigan and New York have frequently alternated as first in rank, Michigan holding the place of honor in 1911. The salt works were formerly by-plants of the lumber industry, and used the sawmill waste for fuel. The decline in the lumber industry and the scarcity of wood for fuel has probably caused the salt works to turn to coal as a fuel and has influenced the coal production of the State. Up to 1896 the highest production of

coal had been made in 1882, with a total of 135,339 tons. Active development of Michigan coal began in 1897, and by 1901 the production had reached nearly 1,250,000 tons. At the present time it usually ranges from 1,500,000 to 2,000,000 tons, though the output in 1911 was a little below the smaller figure. Competition of higher grade coals from Pennsylvania holds back the production from the Michigan mines. Bay and Saginaw counties are the principal producers of both coal and salt.

There are two plants of by-product coke ovens, one at Delray and the other at Wyandotte, but the coal at both of these plants is drawn from mines of West Virginia. The mineral production of Michigan during 1910 and 1911, as far as the same can be shown, was as follows:

*Mineral production of Michigan in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Bromine...pounds | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Calcium chloride, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Cement....barrels | ..... | ..... | 3,687,719 | $3,378,940 | ..... | ..... | 3,686,716 | $3,024,676 |
| Clay products, short tons | 1,424 | b $4,394 | ..... | 2,196,222 | 1,764 | b $5,272 | ..... | 2,083,932 |
| Coal....short tons | 1,534,967 | 2,930,771 | ..... | ..... | 1,476,074 | 2,791,461 | ..... | ..... |
| Coke.....do | ..... | ..... | (b) (c) | (b) (c) | ..... | ..... | (b) (c) | (b) (c) |
| Copper....pounds | ..... | ..... | 221,462,984 | 28,125,799 | ..... | ..... | 218,185,236 | 27,273,155 |
| Gems and precious stones | ..... | ..... | ..... | 2,500 | ..... | ..... | ..... | 4,292 |
| Graphite, amorphous.short tons | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Grindstones | ..... | ..... | ..... | (c) | ..... | ..... | ..... | 153,292 |
| Gypsum.short tons | 357,174 | ..... | ..... | 668,201 | 347,296 | ..... | ..... | 573,926 |
| Iron ore..long tons | 13,303,906 | 41,393,585 | ..... | ..... | 8,944,393 | 23,808,935 | ..... | ..... |
| Iron, pig.....do | ..... | ..... | 307,975 | b5,119,074 | ..... | ..... | 304,654 | b4,672,799 |
| Lime....short tons | ..... | ..... | 72,345 | 303,377 | ..... | ..... | 80,709 | 352,608 |
| Manganiferous ore, long tons | d 285,372 | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Mineral paints, natural pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Mineral waters, gallons sold | 1,454,020 | 69,538 | ..... | ..... | 1,713,401 | 72,253 | ..... | ..... |
| Natural gas | ..... | 820 | ..... | ..... | ..... | 1,330 | ..... | ..... |
| Petroleum..barrels | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Quartz..short tons | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Salt.....barrels | 247,582 | 79,226 | 9,204,440 | 2,152,036 | 553,664 | 177,172 | 9,766,410 | 2,455,983 |
| Sand and gravel, short tons | 2,862,738 | 816,337 | ..... | ..... | 2,185,165 | 565,969 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | 240,649 | ..... | ..... | ..... | 210,001 |
| Scythestones | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (c) |
| Silver, fine ounces (troy) | ..... | ..... | 262,200 | 141,600 | ..... | ..... | 507,700 | 274,100 |
| Stone | ..... | (e) | ..... | e 894,409 | ..... | (e) | ..... | e1,065,520 |
| Miscellaneous | ..... | 31,104 | ..... | 1,584,226 | ..... | 34,420 | ..... | 1,524,754 |
| Total value, eliminating duplications | $83,581,377 | | | | $65,077,232 | | | |

a No report for 1910.
b Value not included in total value.
c Value included under "Miscellaneous."
d Tonnage and value included with iron ore.
e Derived product includes stone sold rough.

The clay products of Michigan are valued at about $2,000,000 annually. The principal clay products are common brick and drain tile, and the leading counties are Wayne, Eaton, Jackson, and Saginaw.

Publication No. 8 of the Michigan Geological and Biological Survey, now in press, contains extended chapters on the occurrence, production, mining methods, and trade conditions of iron, copper, coal, salt, cement, and gypsum in the State.

Michigan leads all the other States in the manufacture of sand-lime brick. The production of 1910 was valued at $240,649, and that of 1911 at $210,001. Michigan also leads in the production of bromine, a by-product of salt manufacture. In addition to the products enumerated above, Michigan is also a producer of lime, mineral waters, building stone, graphite, grindstones, mineral paints, natural gas, oilstones, pig iron, petroleum, quartz, sand, and gravel. It is also a producer of silver as a by-product from copper mining.

## MINNESOTA.

Minnesota's wealth of iron ore gives it prominent place among the mining States, and the production of iron ore is the only important branch of the mining industry in the State. In its output of iron ore Minnesota far outranks all other States, the production of Minnesota in the last two years, in both quantity and value, being considerably more than one-half that of the United States. In 1910 the total production of iron ore in the United States was 56,889,734 long tons, valued at $140,735,607, of which Minnesota produced 31,966,769 long tons, valued at $78,462,560. The iron mining and manufacturing interests experienced a monopoly of hard times and business depression in 1911 and the production of iron ore fell off sharply in sympathy with the decline in the manufacture of pig iron and of steel. The total production of iron ore in the United States decreased in 1911 to 40,989,808 tons, valued at $86,419,830, and the output in Minnesota fell off to 23,398,406 long tons, valued at $48,447,760, the State maintaining its relative proportion of the tonnage. In 1910 Minnesota was credited with 56.2 per cent of the total quantity and 55.75 per cent of the total value; in 1911 it contributed 57.08 per cent of the quantity and 56.06 per cent of the value. The iron-ore production of Minnesota represents 96 per cent of the total value of its mineral products. With pig iron as a basis of production, Minnesota ranks thirty-eighth among the States. With iron ore as the basis of production, Minnesota advances to the seventh place in the list of mining States, with its production in 1910 valued at $83,868,520 and in 1911 at $53,460,561. By far the largest part of the iron production is from the Mesabi iron range, now the most important iron-producing district of the world. The Mesabi is the youngest of the great iron-ore ranges, having been opened in 1892 with a production in that year of less than 30,000 tons; by 1894 it had reached nearly 2,000,000 tons annually, and in 1902, when 10 years of age, it produced over 13,000,000 tons, or nearly one-half of the total output of Lake Superior iron ore. Its maximum output of 30,576,409 tons was attained in 1910. It dropped to 22,160,101 long tons in 1911. The Vermilion Range, one of the older producing districts, is also entirely within Minnesota. Its maximum production was attained in 1902—a total of 2,057,532 tons. The production of the Vermilion Range has shown a declining tendency in the last 10 years, the output of 1911 being only a little more than one-half of what it was in 1902. During 1911 a new range, known as the Cuyuna, was opened in Minnesota,

and the shipments made from this range in this year amounted to 147,431 tons. The iron-ore production of Minnesota is primarily the output of St. Louis County, whose production approximates 75 per cent of the total. Itasca County continues to produce approximately 25 per cent of the total, and smaller quantities come from Crow Wing and Lake counties.

Exclusive of the iron-ore and pig-iron production the value of the mineral products of Minnesota amounted to $5,405,960 in 1910 and to $5,012,801 in 1911. The pig iron produced in 1910 was valued at approximately $960,000 and in 1911 at a little less than $800,000. Among the less important mineral products are those from the quarries and clay pits. These two approximately divided the honor for second and third place in the State's mining industry.

In 1910 the value of the stone production in Minnesota was $1,976,095 and the value of the clay production was $1,901,296. In 1911 the quarry products were valued at $1,702,525 and the clay products at $1,693,478. The principal stone products are granite, limestone, and sandstone. The counties producing limestone are Blue Earth, Hennepin, Le Sueur, and Winona. Those producing sandstone are Nicollet, Pine, and Pipestone. Those producing granite are Benton, St. Louis, Sherburne, and Stearns. Minnesota ranks second among the States in the production of sand-lime brick. The total output in 1910 was valued at $154,250 and in 1911 at $93,734. Other products are sand and gravel, mineral waters, lime, cement, and pottery. A few gems also have been found within the State.

The distribution of the mineral products of Minnesota by substances in 1910 and 1911 was as follows:

*Mineral production of Minnesota in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons..... | (b) | (a) (b) | ..... | c $1,901,296 | ..... | ..... | ..... | c $1,693,478 |
| Coke.....short tons.. | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Feldspar.....do.... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Gems and precious stones..... | ..... | ..... | ..... | 160 | ..... | ..... | ..... | ..... |
| Gypsum.short tons.. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (d) |
| Iron ore...long tons.. | 31,966,769 | $78,462,560 | ..... | ..... | 23,398,406 | $48,447,760 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | b 58,244 | b 959,279 | ..... | ..... | b 56,668 | b 790,827 |
| Lime.....short tons.. | ..... | ..... | 45,194 | 289,227 | ..... | ..... | 39,208 | 242,945 |
| Mineral waters, gallons sold..... | 9,962,370 | 281,009 | ..... | ..... | 8,703,319 | 270,039 | ..... | ..... |
| Sand and gravel, short tons..... | 1,938,112 | 347,138 | ..... | ..... | 1,522,295 | 399,980 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | 154,250 | ..... | ..... | ..... | 93,734 |
| Stone..... | ..... | (e) | ..... | e 1,976,095 | ..... | (e) | ..... | e 1,702,525 |
| Miscellaneous..... | ..... | (e) | ..... | e 724,280 | ..... | (e) | ..... | e 973,004 |
| Total value, eliminating duplications. | $83,868,520 | | | | $53,460,561 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Exclusive of pottery, which is included under "Miscellaneous."
d Not mined, but calcined, in Minnesota. Value included under "Miscellaneous."
e Derived product includes raw product.

## MISSISSIPPI.

The only title of Mississippi to inclusion in the list of mining States rests in the utilization of some of its clays, in the digging of sand, chiefly for building purposes, and gravel, and in the sale of mineral waters. The total value of the mineral products of Mississippi in 1910 was $840,152, of which $632,999 was represented by the value of the clay products, $159,482 by sand and gravel, and $43,975 by the mineral waters sold. In 1911 the clay products were valued at $687,836, the sand and gravel at $286,206, and mineral waters at $75,050, the total value, including a few miscellaneous products, being $1,052,842. Eighty per cent of the value of the clay products is represented by common brick, the remainder being made up of drain tile and front brick. The pottery branch of the clay-working industry has been developed to some extent and wares to the value of about $20,000 are produced annually.

The statistics of production during the last two years have been as follows:

*Mineral production of Mississippi in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | (a) (b) | (a) (b) | ..... | $632,999 | ..... | ..... | ..... | $687,836 |
| Iron ore...long tons | ..... | ..... | ..... | ..... | (b) | (b) | ..... | ..... |
| Mineral waters, gallons sold | 309,450 | $43,975 | ..... | ..... | 346,500 | $75,050 | ..... | ..... |
| Sand and gravel, short tons | 363,121 | 159,482 | ..... | ..... | 631,084 | 286,206 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (b) | ..... | ..... | ..... | (b) |
| Miscellaneous | ..... | (c) | ..... | c 3,701 | ..... | (c) | ..... | c 3,750 |
| Total value, eliminating duplications | $840,152 | | | | $1,052,842 | | | |

a Value not included in total value.
b Value included under "Miscellaneous."
c Derived product includes raw product.

## MISSOURI.

Missouri leads all the other States in the production of four mineral substances, namely, zinc, lead, barytes, and tripoli. It is found in the production of mineral paints, fifth in lime and sand and gravel, sixth in Portland cement, and seventh in clay products. The principal products of the State are spelter (zinc) and lead. The production of spelter in 1910 was 140,652 short tons, valued at $15,190,416, and in 1911, 127,540 tons, valued at $14,539,560. The value of the lead product was less than that of spelter in 1910, but took first place in 1911, the production in 1910 being 161,659 short tons, valued at $14,225,992, and in 1911, 182,207 tons, valued at $16,398,630. The lead and spelter production constitutes 60 per cent of the State's total value in mineral products. Missouri furnishes 55 per cent of the total spelter product of the United States, and from 40 to 45 per cent of the total lead. The lead ores of Mis-

souri and the other States of the Mississippi Valley are almost free from silver, and the lead produced from them is known to the trade as "soft lead."

The principal producing counties of lead and zinc ores are St. Francois and Jasper.

Coal mining in Missouri has not shown much progress in recent years, although this State ranks first in priority of coal production in the States west of the Mississippi River, the census of 1840 showing a production of 9,972 short tons in that year. The maximum production was attained in 1903, when 4,238,586 tons were mined. Since then the industry has shown a declining tendency, the production in 1910 being 2,982,433 short tons, and in 1911, 3,760,607 tons. The smaller production in 1910, the smallest in 13 years, was due to the prolonged miners' strike in that year Competition with the more cheaply mined coal of Illinois, and in the last few years with petroleum and natural gas from the Mid-Continent field of Oklahoma and Kansas, has kept back production from the Missouri mines. The principal coal-producing counties are Macon, Lafayette, Adair, Ray, and Barton.

Fourth in importance in Missouri's mineral production are the clay-working industries, which contributed $7,087,766 in 1910 and $6,274,353 in 1911. The principal clay product is fire brick, and the fire brick region is in the immediate vicinity of St. Louis. In the value of its fire brick product Missouri ranks second among the States, being exceeded only by Pennsylvania, though Ohio also exceeds Missouri in the quantity of fire brick produced. The average value per thousand of the fire brick produced in Missouri was $20.28 in 1911, and that of Ohio's product was $16.46 per thousand. The total value of Missouri's clay products in 1911 was $6,274,353, of which fire brick furnished $1,763,548, common brick $1,309,164, sewer pipe $1,156,626, vitrified brick $488,299, and front brick $330,332. Drain tile and fireproofing are also important products, and, in fact, Missouri contributes something to most of the varied products from clay.

Missouri's production of Portland cement amounted to 4,114,859 barrels, valued at $3,349,312, in 1911, against 4,455,589 barrels, valued at $3,858,088, in 1910. The cement plants are located near St. Louis and Kansas City and at Hannibal and Cape Girardeau, all but the one near Kansas City being along the Mississippi River in the eastern part of the State.

The principal quarry product of Missouri is limestone, the value of this product in 1910 being $2,360,604 out of a total value for all stone of $2,520,665, and in 1911 $2,179,767 out of a total value of $2,338,585. Granite and sandstone are also produced in the State. The leading counties in the production of limestone are Jasper, Cape Girardeau, Greene, Jackson, Marion, St. Louis, and St. Louis City.

The production of lime amounted to 158,368 short tons, valued at $722,563, in 1911, against 179,550 tons, valued at $846,123, in 1910.

The less important mineral products of Missouri are barytes, copper, gems (occasionally), tripoli, mineral paints, mineral waters, natural gas, petroleum, iron ores, pyrite, sublimed lead, silver, sand, and gravel.

The total value of the mineral products of Missouri in 1910 was $51,857,640 and in 1911 $52,636,348.

The distribution of the mineral production of Missouri, by substances, in 1910 and 1911 was as follows:

*Mineral production of Missouri in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity | Value. | Quantity. | Value. |
| Barytes..short tons.. | 22,978 | $75,598 | ..... | ..... | 21,500 | $81,380 | ..... | ..... |
| Briquets, fuel..do.... | ..... | ..... | (a) | (a) | ..... | ..... | (b) (d) | (b) (d) |
| Cement.....barrels.. | ..... | ..... | 4,455,589 | $3,858,088 | ..... | ..... | 4,114,859 | $3,349,312 |
| Clay products, short tons..... | 287,445 | b 509,433 | ..... | 7,087,766 | 227,691 | b 512,088 | ..... | 6,274,353 |
| Coal.....short tons.. | 2,982,433 | 5,328,285 | ..... | ..... | 3,760,607 | 6,431,066 | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 94,452 | 11,995 | ..... | ..... | 640,411 | 80,051 |
| Gems and precious stones..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 25 |
| Gypsum .short tons.. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (c) |
| Iron ore...long tons.. | 78,341 | 168,697 | ..... | ..... | 72,788 | 153,676 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | b 55,536 | b1,014,213 | ..... | ..... | b 66,665 | b1,108,940 |
| Lead.....short tons.. | ..... | ..... | 161,659 | 14,225,992 | ..... | ..... | 182,207 | 16,398,630 |
| Lime.....do.... | ..... | ..... | 179,550 | 846,123 | ..... | ..... | 158,368 | 722,563 |
| Mineral paints, natural pigments, short tons..... | ..... | ..... | (d) | (d) | ..... | ..... | (d) | (d) |
| Zinc-lead pigments, short tons..... | ..... | ..... | (d) | (d) | ..... | ..... | (d) | (d) |
| Mineral waters, gallons sold..... | 657,035 | 96,488 | ..... | ..... | 542,892 | 86,747 | ..... | ..... |
| Natural gas..... | ..... | 12,611 | ..... | ..... | ..... | 10,496 | ..... | ..... |
| Petroleum...barrels.. | (d) | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Pyrite....long tons.. | ..... | ..... | ..... | ..... | (d) | (d) | ..... | ..... |
| Sand and gravel, short tons..... | 6,108,460 | 1,339,519 | ..... | ..... | 3,605,913 | 1,042,674 | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 32,200 | 17,400 | ..... | ..... | 49,100 | 26,500 |
| Stone..... | ..... | 725,922 | ..... | 1,794,743 | ..... | (e) | ..... | e2,338,585 |
| Tripoli..... | ..... | ..... | ..... | 71,978 | ..... | ..... | ..... | (d) |
| Zinc.....short tons.. | ..... | ..... | 140,652 | 15,190,416 | ..... | ..... | 127,540 | 14,539,560 |
| Miscellaneous..... | ..... | (e) | ..... | e1,006,019 | ..... | 9,795 | ..... | 1,144,500 |
| Total value, eliminating duplications.. | $51,857,640 | | | | 52,636,348 | | | |

a No report for 1910.
b Value not included in total value.
c Not mined, but calcined, in Missouri. Value included under "Miscellaneous."
d Value included under "Miscellaneous."
e Derived product includes raw product.

## MONTANA.

Montana ranks eighth among the States in the value of its mineral production, the chief industry being the mining and smelting of copper ores. In the production of copper Montana holds second place, with Arizona first. Montana's output of copper in 1911 was 271,814,491 pounds, valued at $33,976,811 against 283,078,473 pounds, valued at $35,950,966 in 1910. The total value of the mineral products was $53,454,926 in 1911, and $54,388,119 in 1910, so that the value of the copper output approximates 70 per cent of the total. As is well known, the center of the copper mining industry of Montana is in and around the city of Butte, with less important camps scattered through the southwestern part of the State. The reduction works are at Butte, Anaconda, and Great Falls. A small quantity of copper was produced in Montana as early as 1868, but it was not until 1882, the first year for which the volume of Mineral

Resources was published, that the industry began to assume importance. In 1881 the production was less than 1,500,000 pounds. It rose to over 9,000,000 pounds in 1882. By 1887 it had reached 78,699,677 pounds, and Montana outranked Michigan, holding the premiership, except in one year (1891) until superseded by Arizona in 1907, 20 years later. Once since then (in 1909) Montana again held first place. Montana's total production of copper to the close of 1911 has amounted to 5,598,253,884 pounds, somewhat more than one-third the total production of the United States. Montana also ranks second in the production of silver, with Nevada in first place by a small majority—less than 1 per cent. Montana's production of silver was 12,282,900 fine ounces, valued at $6,632,700, in 1910 and 12,163,900 ounces, valued at $6,568,500, in 1911. Most of the silver is obtained in the refining of copper.

The statistics of production in Montana in 1910 and 1911 are given in the following table:

*Mineral production of Montana in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons..... | 7,011 | b $10,069 | ..... | c $411,824 | 4,912 | b $9,617 | ..... | c $260,547 |
| Coal.....do.... | 2,920,970 | 5,329,322 | ..... | ..... | 2,976,358 | 5,342,168 | ..... | ..... |
| Coke.....do.... | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 283,078,473 | 35,950,966 | ..... | ..... | 271,814,491 | 33,976,811 |
| Gems and precious stones..... | ..... | ..... | ..... | 57,923 | ..... | ..... | ..... | 221,613 |
| Gold, fine ounces (troy)..... | ..... | ..... | 179,975 | 3,720,400 | ..... | ..... | 176,554 | 3,649,700 |
| Grindstones..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (a) |
| Gypsum..short tons.. | (a) | ..... | ..... | (a) | (a) | ..... | ..... | (a) |
| Lead.....do.... | ..... | ..... | 1,790 | 157,520 | ..... | ..... | 2,499 | 224,910 |
| Lime.....do.... | ..... | ..... | 4,480 | 26,925 | ..... | ..... | 3,100 | 18,480 |
| Mineral waters, gallons sold..... | (a) | (a) | ..... | ..... | 74,750 | 5,988 | ..... | ..... |
| Sand and gravel, short tons..... | (a) | (a) | ..... | ..... | 5,143 | 2,461 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 12,282,900 | 6,632,700 | ..... | ..... | 12,163,900 | 6,568,500 |
| Stone..... | ..... | (d) | ..... | d 452,755 | ..... | (d) | ..... | d 212,233 |
| Zinc.....short tons.. | ..... | ..... | 12,408 | 1,340,064 | ..... | ..... | 22,115 | 2,521,110 |
| Miscellaneous..... | ..... | 7,491 | ..... | 419,135 | ..... | ..... | ..... | 450,405 |
| Total value, eliminating duplications.. | $54,388,119 | | | | $53,454,926 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Exclusive of pottery, which is included under "Miscellaneous."
d Derived product includes stone sold rough.

The first record of coal production in Montana is for 1880, when an output of 224 short tons was reported. The production did not exceed 1,000,000 tons until 1895, since when it has steadily progressed and in 1911 reached the maximum of 2,976,358 tons, valued at $5,342,168. The principal operations have been in Carbon and Cascade counties, but recent developments in the Bull Mountain field in Fergus and Musselshell counties, following the completion of the Chicago, Milwaukee & Puget Sound Railway, are bringing those counties prominently to the front.

In the production of gold (like silver, largely recovered from copper refining) Montana ranks seventh among the States with a production valued at $3,720,400 in 1910 and at $3,649,700 in 1911. Montana leads in the production of precious stones, this supremacy being due to the mining of sapphire, one of the few instances of gem mining conducted as an industry in the United States.

In the production of spelter, Montana holds fifth place, with a production in 1910 of 12,408 short tons, valued at $1,340,064, and in 1911 of 22,115 tons, valued at $2,521,110.

The other mineral products of Montana are arsenic, clay, lead, cement, grindstones, gypsum, lime, mineral waters, sand-lime brick, stone, sand, and gravel.

## NEBRASKA.

Nebraska has been termed "the State without a mine," but it has clay deposits that are utilized, sand and gravel pits, some stone quarries, and waters sold commercially. There are also deposits of volcanic ash or pumice, and in the production of the last mentioned Nebraska ranks first among the States. The value of the clay products in 1911 amounted to $795,894 out of a total $1,316,168, and in 1910 to $938,827 out of a total $1,552,794. The principal clay product is common brick. The other clay products made are vitrified brick, front brick, drain tile, and fireproofing. These clay resources have their greatest development in Douglas, Adams, Lancaster, and Dodge counties. Stone quarries, all of which are of limestone, are located in Cass and Gage counties. Most of the product is crushed for the manufacture of concrete. The total value of the limestone in 1910 was $338,731 and in 1911 $263,501. The production of sand and gravel amounted in 1910 to 1,076,602 short tons, valued at $168,255, and in 1911 to 858,288 tons, valued at $156,777. The sand production is used chiefly for building purposes. Although Nebraska ranks first in the production of pumice, the output may not be published separately, as there are less than three producers in the State. A small quantity of sand-lime brick is manufactured in Fremont County.

The statistics of mineral production in Nebraska in 1910 and 1911 are given in the following table:

*Mineral production of Nebraska in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products | ..... | ..... | ..... | $938,827 | ..... | ..... | ..... | $795,894 |
| Mineral waters, gallons sold | 12,785 | $1,529 | ..... | ..... | 21,641 | $1,925 | ..... | ..... |
| Pumice..short tons | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons | 1,076,602 | 168,255 | ..... | ..... | 858,288 | 156,777 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Stone | ..... | 50,547 | ..... | 288,184 | ..... | (b) | ..... | b 263,501 |
| Miscellaneous | ..... | (b) | ..... | b 105,452 | ..... | (b) | ..... | b 98,071 |
| Total value, estimating duplications | | $1,552,794 | | | | $1,316,168 | | |

a Value included under "Miscellaneous." b Derived product includes raw product.

## NEVADA.

In the glory days of the famous Comstock lode and before the active days of Leadville, Cripple Creek, the Homestake, and other great western camps—before the days of the Yukon and Alaska—Nevada was relatively more important as a mining State than it is to-day. But although the glamor of the Comstock days has departed, the mining industry has by no means ceased to exist, and at the present time Nevada ranks sixteenth among the States in the value of its mineral production. It still ranks first in the production of silver, though reduced as compared with the annual output from 1873 to 1878, when the Comstock lode, the greatest silver-producing deposit the world has known, was yielding from 10,000,000 to 17,000,000 ounces of silver a year. In addition to being now, as then, the premier silver-producing State, Nevada holds third place in rank as a producer of gold, the yellow metal coming mainly from the Goldfield district, in Esmeralda County, first productive in 1903; the Tonopah district, in Nye County, first productive in 1902; and the new National district, in Humboldt County. The gold production of Nevada in 1910 amounted to $18,873,700, and in 1911 to $18,096,900. By far the larger part of the production came from siliceous ores. The value of the silver production is approximately one-third that of gold, amounting to 12,366,000 fine ounces, valued at $6,677,600 in 1910, and to 13,185,900 ounces, valued at $7,120,400, in 1911. Of the total production the Tonopah district in Nye County contributes about 90 per cent, mainly from siliceous ores. Mineral County ranks second, Storey County, the home of the Comstock, third, and Humboldt County fourth. The production from the Comstock was 320,716 fine ounces in 1910 and 618,000 ounces in 1911. The largest output from the Comstock was in 1876, when over 17,000,000 ounces were produced. This famous district was opened in 1860, ran a spectacular course for 20 years, and then began to decline. As shown above, it is now of little importance.

Although copper mining on an important scale did not begin in Nevada until 1908, the State now ranks fifth in the production of this metal. The Ely district in White Pine County is the only producer of any importance. In 1907, before the district was thoroughly developed, the copper production of the State was less than 2,000,000 pounds. In 1908 it was nearly 12,250,000 pounds; in 1909 it was nearly 54,000,000 pounds; in 1910 it was over 64,000,000 pounds, and in 1911 it was 65,561,015 pounds. In 1910 the total value of the mineral production of Nevada was $34,617,127, of which gold, silver, and copper made up $33,742,119; in 1911 the total production was valued at $34,148,101, of which the three metals constituted $33,412,427. The other mineral products of the State, none of which is of much importance compared with the three chief metals, are clay products, coal, precious stones, graphite, gypsum, infusorial earth, lime, lead, mineral waters, quicksilver, salt, sand, gravel, stone, sulphur, and zinc.

The following table shows the quantity and value of the mineral products of Nevada in 1910 and 1911:

*Mineral production of Nevada in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products | | | | (a) | | | | (a) |
| Coal.....short tons | | | | | (a) | (a) | | |
| Copper.....pounds | | | 64,494,640 | $8,190,819 | | | 65,561,015 | $8,195,127 |
| Gems and precious stones | | | | 49,210 | | | | 6,295 |
| Gold, fine ounces (troy) | | | 913,015 | 18,873,700 | | | 875,438 | 18,096,900 |
| Graphite, amorphous..short tons | (a) | (a) | | | (a) | (a) | | |
| Gypsum.....do | (a) | | | (a) | (a) | | | (a) |
| Infusorial earth | | | | | | | | (a) |
| Lead.....short tons | | | 2,195 | 193,10 | | | 1,083 | 97,470 |
| Lime.....do | | | | | | | (a) | (a) |
| Mineral waters, gallons sold | (a) | (a) | | | (a) | (a) | | |
| Quicksilver...flasks | | | 70 | 3,2 | | | (a) | (a) |
| Salt.....barrels | | | 17,535 | 10,600 | 2,60 | $2,495 | 10,250 | 14,547 |
| Sand and gravel, short tons | | | | | 223,510 | 33,591 | | |
| Silver, fine ounces (troy) | | | 12,366,000 | 6,677,600 | | | 13,185,900 | 7,120,400 |
| Stone | | | | (a) | | | | (a) |
| Sulphur...long tons | (a) | (a) | | | | | | |
| Tungsten ore (60 per cent concentrates), short tons | | | | | | | (a) | (a) |
| Zinc.....do | | | 1,516 | 163,728 | | | 1,595 | 181,830 |
| Miscellaneous | | $12,150 | | 442,904 | | 10,527 | | 378,482 |
| Total value, eliminating duplications | | | $34,617,127 | | | | $34,148,101 | |

a Value included under "Miscellaneous."

## NEW HAMPSHIRE.

The principal mineral product of New Hampshire is granite, the value of which ($1,239,656 in 1910 and $1,017,272 in 1911) represents more than one-half the total value of all the mineral production of the State. The principal quarrying operations are in Carroll, Cheshire, Hillsboro, and Merrimack counties. The granite is used chiefly for building purposes and for monumental work.

The manufacture of common brick is the only use made of the clay resources of the State. This industry, which contributes 25 per cent of the total value of mineral products, is located chiefly in Strafford, Rockingham, and Merrimack counties. Ten per cent of the total value is derived from the sale of mineral waters.

The less important mineral products are copper, fluorspar, garnet, gems (occasionally), gold, mica, silver, and scythestones.

The following table shows the mineral production of New Hampshire in 1910 and 1911:

*Mineral production of New Hampshire in 1910 and 1911.*

| Product | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products | ..... | ..... | ..... | [a] $566,121 | ..... | ..... | ..... | [a] $430,748 |
| Copper.....pounds | ..... | ..... | 12,409 | 1,576 | ..... | ..... | ..... | ..... |
| Fluorspar.short tons | ..... | ..... | ..... | ..... | [b] | [b] | ..... | ..... |
| Garnet.....do | [b] | [b] | ..... | ..... | [b] | [b] | ..... | ..... |
| Gems and precious stones | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 20 |
| Gold, fine ounces (troy) | ..... | ..... | [b] | [b] | ..... | ..... | ..... | ..... |
| Mica | ..... | ..... | ..... | [b] | ..... | ..... | ..... | 44,927 |
| Mineral waters, gallons sold | 706,828 | $202,831 | ..... | ..... | 406,660 | $139,130 | ..... | ..... |
| Scythestones | ..... | ..... | ..... | [b] | ..... | ..... | ..... | [b] |
| Silver, fine ounces (troy) | ..... | ..... | [b] | [b] | ..... | ..... | ..... | ..... |
| Stone | ..... | 179,984 | ..... | 1,059,672 | ..... | [c] | ..... | [c] 1,017,272 |
| Miscellaneous | ..... | [c] | ..... | [c] 132,669 | ..... | 24,708 | ..... | 70,840 |
| Total value, eliminating duplications | $2,142,853 | | | | $1,727,645 | | | |

[a] Exclusive of pottery, which is included under "Miscellaneous."
[b] Value included under "Miscellaneous."
[c] Derived product includes raw product.

## NEW JERSEY.

New Jersey is the only State of any importance as a mineral producer in which the utilization of the clay resources constitutes the chief industry and in which the value of the clay products represents over 50 per cent of the total output of the State. The clay products of New Jersey include every variety of brick and tile, except vitrified brick, and every variety of pottery produced in the United States. The total value of the clay products in 1910 was $17,834,309, of which $9,245,854 represented the value of brick and tile and $8,588,455 the value of pottery. In 1911 the brick and tile products were valued at $9,776,287 and pottery at $8,401,941, the total value being $18,178,228. In the total value of its clay products New Jersey ranks third among the States, being exceeded by Ohio and Pennsylvania. In the value of the pottery produced New Jersey holds second place, Ohio being first. The principal brick and tile products are common brick, architectural terra cotta, fireproofing, tile (not drain), fire brick, and front brick, and the leading producing counties are Mercer, Middlesex, Bergen, and Camden. The chief center of the pottery industry is at Trenton. Second to clay working is the manufacture of Portland cement, the plants in the vicinity of Phillipsburg being the eastern end of the celebrated Lehigh district of Pennsylnia. The production of cement in 1911 amounted to 4,411,890 barrels, valued at $3,259,528, against 4,184,698 barrels, valued at $3,067,265, in 1910.

New Jersey ranks third among the States in the production of spelter and is the most important among the Eastern States. The zinc-producing region is the famous Franklin Furnace district in Sussex County, the most northerly county in the State. Mining has been carried on in this region continuously for over 60 years. The production of spelter in New Jersey was 20,217 short tons, valued at $2,183,436, in 1910, and 15,128 tons valued at $1,724,592, in 1911.

The principal quarry product of New Jersey is trap rock, produced in the Palisades region (Bergen, Essex, Hudson, Hunterdon, Morris, Somerset, and Union counties) and used chiefly for road making and railroad ballast. The total value of all stone quarried in New Jersey in 1910 was $1,675,174, of which $1,257,712 was the value of the trap rock produced. The total value of all stone produced in 1911 was $1,597,410, of which $1,136,385 was represented by trap rock. Limestone to the value of $224,707 in 1910 and of $138,148 in 1911 was quarried in Hunterdon, Sussex, and Warren counties. Sandstone is produced in Bergen, Hunterdon, and Mercer counties.

New Jersey is one of the leading producers of molding sand, the output in 1910 amounting to 679,191 short tons, valued at $436,460, and in 1911 to 715,654 short tons, valued at $392,840. The total value of all sand and gravel produced in 1910 was $1,139,275 and in 1911, $1,058,926. Other products of the State are pig iron, iron ore, occasional gems, lime, mineral waters, sand-lime brick, slate, slate pigments, soapstone, and zinc oxide.

The total value of the mineral products of New Jersey in 1910 was $28,266,383 and in 1911, $27,559,246, distributed as follows:

*Mineral production of New Jersey in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Cement.....barrels | ..... | ..... | 4,184,698 | $3,067,265 | ..... | ..... | 4,411,890 | $3,259,528 |
| Clay products, short tons | 405,591 | b $657,805 | ..... | 17,834,309 | 405,912 | b $658,875 | ..... | 18,178,228 |
| Coke.....short tons | ..... | ..... | (b) (c) | (b) (c) | ..... | ..... | (b) (c) | (b) (c) |
| Gems and precious stones | ..... | ..... | ..... | 500 | ..... | ..... | ..... | 350 |
| Iron ore...long tons | 521,832 | 1,582,213 | ..... | ..... | 359,721 | 1,158,271 | ..... | ..... |
| Iron, pig.....do | ..... | ..... | 239,221 | b3,797,656 | ..... | ..... | b 41,835 | b 583,300 |
| Lime.....short tons | ..... | ..... | 34,148 | 128,964 | ..... | ..... | 27,057 | 113,784 |
| Mineral paints, zinc-lead pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Mineral waters, gallons sold | 1,583,050 | 133,139 | ..... | ..... | 2,233,627 | 210,123 | ..... | ..... |
| Sand and gravel short tons | 2,962,815 | 1,139,275 | ..... | ..... | 3,352,765 | 1,058,926 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | 23,811 | ..... | ..... | ..... | 17,710 |
| Slate | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (c) |
| Stone | ..... | 270,473 | ..... | 1,404,701 | ..... | (d) | ..... | d 1,597,410 |
| Talc.....short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Zinc.....do | ..... | ..... | 20,217 | 2,183,436 | ..... | ..... | 15,128 | 1,724,592 |
| Miscellaneous | ..... | ..... | ..... | 1,158,004 | ..... | ..... | ..... | 925,056 |
| Total value, eliminating duplications | $28,266,383 | | | | $27,559,246 | | | |

a No report for 1910.
b Value not included in total value.
c Value included in "Miscellaneous."
d Derived product includes stone sold rough.

## NEW MEXICO.

Two States included in the Rocky Mountain division lay more claim to recognition as mining States by reason of their production of coal than by their output of precious or semiprecious metals. One of the States is Wyoming, the other is the new State of New Mexico. The latter is not of much prominence as a mining State at the present time, the main support of the population being cattle raising and other forms of agriculture, New Mexico ranking eighth among the Rocky Mountain States in the value of its mineral output. In 1910 the total value of all the mineral produced in New Mexico was $7,902,036, of which the coal production represented $4,877,151, or 62 per cent; in 1911 the total value was $7,869,918 of which the coal mines contributed $4,525,925, or 58 per cent. The principal coal-mining operations are in the Raton-Trinidad district of Colfax County, and in the Gallup district of McKinley County (formerly a part of Bernalillo County). These two districts produce over 90 per cent of the coal output of the State. The Raton district produces a good grade of coking coal and extensive coking operations are carried on at Dawson, which may truthfully be described as a model coal mining camp both in the town itself and in the up-to-date character of the mining methods employed.

As already indicated, New Mexico makes little pretension to importance as a metal-mining State. One of the leading metal products is copper, valued in 1910 at $480,645 and in 1911 at $357,550. The principal production is from the Central and Lordsburg districts in Grant County. The gold production, most of which is from siliceous ores mined at Mogollon in Socorro County, was valued at $477,200 in 1910 and at $761,600 in 1911. The Mogollon district is also the chief producer of silver, of which the total production of the State was valued at $420,600 in 1910 and at $724,300 in 1911. The zinc production in the last two years exceeded the value of the copper output. The zinc-producing counties are Grant, Socorro, and Santa Fe, all of the product of Santa Fe County and part of that from Socorro County being from lead-zinc ores. The zinc product of the State was valued at $530,388 in 1910 and at $430,692 in 1911. The quarry products rank along with the several metals, the value of the stone produced in the last two years being $443,650 for 1910 and $406,454 for 1911. Limestone from Guadalupe, San Miguel, and Santa Fe counties constitutes 99 per cent of the stone production. It is used chiefly for railroad ballast. The other mineral products of the State are coke, fluorspar, gypsum, iron ore, lead, lime, mica, mineral waters, salt, vanadium minerals, turquoise and other gem materials, clay products, sand and gravel.

The following table shows the quantity and value of the mineral products of New Mexico in 1910 and 1911:

*Mineral production of New Mexico in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | 14,235 | [a] $30,727 | | [b] $129,275 | 8,514 | [a] $12,800 | | [b] $174,651 |
| Coal.....short tons | 3,508,321 | 4,877,151 | | | 3,148,158 | 4,525,925 | | |
| Coke.....do | | | 401,646 | [a] 1,306,136 | | | 381,927 | [a] 1,240,963 |
| Copper.....pounds | | | 3,784,609 | 480,645 | | | 2,860,400 | 357,550 |
| Fluorspar.short tons | [c] | [c] | | | [c] | [c] | | |
| Gems and precious stones | | | | 16,800 | | | | 26,655 |
| Gold, fine ounces (troy) | | | 23,085 | 477,200 | | | 36,847 | 761,700 |
| Gypsum.short tons | [c] | | | [c] | [c] | | | [c] |
| Iron ore...long tons | 188,720 | 189,112 | | | 145,195 | 146,401 | | |
| Lead.....short tons | | | 1,731 | 152,328 | | | 1,381 | 124,290 |
| Lime.....do | | | 4,445 | 17,930 | | | 1,945 | 13,004 |
| Mica | | | | [c] | | | | [c] |
| Mineral waters, gallons sold | 171,600 | 30,160 | | | 226,333 | 41,833 | | |
| Salt.....barrels | | | [c] | [c] | | | [c] | [c] |
| Sand and gravel, short tons | 4,310 | 2,043 | | | 267,615 | 18,774 | | |
| Silver, fine ounces (troy) | | | 779,000 | 420,600 | | | 1,341,400 | 724,300 |
| Stone | | [d] | | [d] 443,650 | | [d] | | [d] 406,454 |
| Vanadium, short tons | | | | | | | [c] | [c] |
| Zinc.....short tons | | | 4,911 | 530,388 | | | 3,778 | 430,6929 |
| Miscellaneous | | [d] | | [d] 134,754 | | [d] | | [d] 117 68 |
| Total value, eliminating duplications | $7,902,036 | | | | $7,869,918 | | | |

[a] Value not included in total value.
[b] Exclusive of pottery, which is included under "Miscellaneous."
[c] Value included under "Miscellaneous."
[d] Derived product includes raw product.

## NEW YORK.

New York, first in the number of its inhabitants and first in the value of its manufactures, ranks thirteenth among the States in the value of its mineral output. It produces no coal and none of the precious and semiprecious metals. Its fuel production consists of petroleum and natural gas, valued approximately at $1,500,000 each. Only a small part of the latter is used for fuel in industrial enterprises. Practically all of the coal consumed in the State of New York is drawn from the anthracite and bituminous mines of Pennsylvania, which are within close proximity. Although New York is without any production of coal or metals (except iron) and ranks as low as thirteenth among the States, it is the premier producer of eight mineral products. The mineral substances in which New York ranks first in production are emery, abrasive garnet, graphite, gypsum, millstones, salt, fibrous talc, and natural cement. It is second in the production of mineral waters, sand and gravel, stone, and iron pyrite; third in the production of sand-lime brick; fourth in the production of iron ore, pig iron, feldspar, and infusorial earth. With pig iron as the basis of production, the total value of the mineral products of New York in 1910 was $73,799,494, of which pig iron constituted $31,693,623, and in 1911 the total value of the mineral products was $63,357,365, of which the value of the pig iron was $23,924,194, from which it appears that the value of the pig iron is from 40 to 45 per

cent of the total production. If the value of the pig-iron be deducted and that of the iron-ore production added, the total value of the mineral production of New York in 1910 was $45,954,554, and in 1911, $42,392,180. Of these the clay-working industries furnish the larger proportion, or about 25 per cent. The principal clay product is common brick, manufactured in the Hudson River region, embracing the counties of Albany, Columbia, Dutchess, Greene, Orange, Rensselaer, Rockland, Ulster, and Westchester, the largest brick-producing region in the world. New York contributes to all of the other brick and tile products, most important of which, next to common brick, is architectural terra cotta. The brick and tile products of the State were valued at $9,778,288 in 1910, and at $8,006,012 in 1911. The pottery products consist principally of porcelain electrical supplies and of delft and belleek ware. The total value of the pottery products in 1910 was $2,093,661, and in 1911 it was $2,178,364. The total value of the clay production in 1911 was $10,184,376, against $11,871,949 in 1910.

Next to the clay products those of the quarries represent the largest value of New York's total mineral production, and the utilization of these resources, which is chiefly for the building of permanent structures, is of sociological interest in that it bears witness to the development of desirable citizenship. The stone quarries of New York produced in 1910 stone valued at $6,410,688, and in 1911 at $6,895,466. The principal stone quarried is limestone, produced in Albany, Cayuga, Dutchess, Erie, Genesee, Madison, Montgomery, Niagara, Onondaga, Rockland, St. Lawrence, and Schoharie counties; sandstone is produced in Orleans, Broome, Ulster, Chenango, Delaware, and Wyoming counties; and trap rock is produced in Rockland County. Marble and granite are of less commercial importance. The iron-ore production of New York amounted in 1910 to 1,287,209 long tons, valued at $3,848,683, and in 1911 to 1,057,984 tons, valued at $2,959,009. The principal ore produced is magnetite from the vicinity of Port Henry on Lake Champlain. The cement production of New York in 1910 amounted to 3,296,350 barrels of Portland cement, valued at $2,906,551, and of 304,598 barrels of natural cement, valued at $150,952; in 1911 the production consisted of 3,314,217 barrels of Portland cement, valued at $2,669,194, and the combined production of natural cement in New York and Pennsylvania was 429,832 barrels, valued at $178,937. The manufacture of natural cement, which at one time was an important industry in New York, has been almost entirely displaced by Portland cement, of which a more uniform product can be made than is possible in the manufacture of natural cement. The location of the former important natural-cement industry was in the vicinity of Rockdale, and by far the larger portion of the natural cement produced in the United States was from this district. In 1882 the production of natural cement from Rockdale was 3,165,000 barrels. From 1891 to 1900 the average annual production was approximately 8,000,000 barrels. In 1903 the decline began and fell off rapidly, until in 1911, when the total production of natural cement in the United States was less than 1,000,000 barrels.

The gypsum products of the State in 1910 were valued at $1,153,977 and in 1911 at $1,199,596. This is one of the eight industries in which New York ranks first. The quantity of gypsum mined was 467,339

short tons in 1910 and 472,834 tons in 1911. The values as given above are for the production in the condition when first sold, whether the material was marketed crude, ground for land plaster, or calcined into plaster of Paris. When calcined the value of the calcined product is considered. The principal counties in the production of gypsum are Erie, Genesee, Monroe, and Onondaga. New York also leads in the production of salt, most of which is obtained from evaporation of brine in Onondaga, Livingston, Genesee, and Wyoming counties. The production in Onondaga County is obtained largely by solar evaporation from brines taken from the State reservation. The production in the other districts, of which Warsaw, in Wyoming County, is the most important, is obtained by artificial evaporation.

The following table shows the quantity and value of the mineral products of New York in 1910 and 1911:

*Mineral production of New York in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Abrasives, artificial, pounds | ..... | ..... | (a) (d) | (a) (d) | ..... | ..... | (a) (d) | (a) (d) |
| Aluminum .pounds | ..... | ..... | b47,734,000 | b$8,955,700 | ..... | ..... | b46,125,000 | b$8,084,000 |
| Briquets, fuel, short tons | ..... | ..... | (c) | (c) | ..... | ..... | 22,350 | a123,925 |
| Cement.....barrels | ..... | ..... | 3,600,948 | 3,057,503 | ..... | ..... | 3,601,789 | 2,812,440 |
| Clay products, short tons | 5,880 | a $13,241 | ..... | 11,871,949 | 4,882 | a $10,308 | ..... | 10,184,376 |
| Coke.....short tons | ..... | ..... | 652,459 | a 2,635,873 | ..... | ..... | 686,172 | a2,883,990 |
| Emery.....do | (d) | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Feldspar.....do | 12,412 | 47,864 | ..... | ..... | 18,800 | 79,926 | ..... | ..... |
| Ferro-alloys, long tons | ..... | ..... | (e) | (e) | ..... | ..... | (a) (d) | (a) (d) |
| Garnet, abrasive, short tons | (d) | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Graphite, crystalline, pounds | 2,605,000 | 158,500 | ..... | ..... | 2,480,000 | 136,750 | ..... | ..... |
| Graphite, artificial, pounds | ..... | ..... | 13,149,100 | a 945,000 | ..... | ..... | 10,144,000 | a 644,000 |
| Gypsum .short tons | 467,339 | ..... | ..... | 1,153,977 | 472,834 | ..... | ..... | 1,199,596 |
| Infusorial earth | ..... | ..... | ..... | (d) | ..... | ..... | ..... | (d) |
| Iron ore...long tons | 1,287,209 | 3,848,683 | ..... | ..... | 1,057,984 | 2,959,009 | ..... | ..... |
| Iron, pig.....do | ..... | ..... | 1,895,018 | a31,693,623 | ..... | ..... | 1,537,201 | a23,924,194 |
| Lime.....short tons | ..... | ..... | 146,474 | 620,564 | ..... | ..... | 119,707 | 524,845 |
| Millstones | ..... | ..... | ..... | 13,753 | ..... | ..... | ..... | 13,335 |
| Mineral paints, natural pigments, short tons | ..... | ..... | 17,721 | 93,416 | ..... | ..... | 12,303 | 66,406 |
| Mineral waters, gallons sold | 8,780,903 | 858,635 | ..... | ..... | 10,245,261 | 939,003 | ..... | ..... |
| Natural gas | ..... | 1,678,720 | ..... | ..... | ..... | 1,418,767 | ..... | ..... |
| Petroleum...barrels | 1,053,838 | 1,414,668 | ..... | ..... | 952,515 | 1,248,950 | ..... | ..... |
| Pyrite.....long tons | (d) | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Quartz...short tons | (d) | (d) | ..... | ..... | (d) | (d) | ..... | ..... |
| Salt.....barrels | (d) | (d) | (d) | (d) | (d) | (d) | (d) | (d) |
| Sand and gravel, short tons | 7,129,096 | 2,305,123 | ..... | ..... | 7,537,578 | 2,414,452 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | 89,150 | ..... | ..... | ..... | 95,930 |
| Slate | ..... | ..... | ..... | 84,822 | ..... | ..... | ..... | 120,359 |
| Stone | ..... | 1,039,570 | ..... | 5,371,118 | ..... | (f) | ..... | f6,895,466 |
| Talc, fibrous, short tons | ..... | ..... | 71,710 | 728,180 | ..... | ..... | 62,030 | 613,286 |
| Miscellaneous | ..... | 1,187,468 | ..... | 2,921,471 | ..... | 1,208,189 | ..... | 3,710,535 |
| Total value, eliminating duplications | | $45,954,554 | | | | $42,392,180 | | |

a Value not included in total value.
b Consumption.
c No report for 1910.
d Value included under "Miscellaneous."
e Not collected for 1910.
f Derived product includes stone sold rough.

The production of fibrous talc is practically a monopoly in New York. It is used in the manufacture of medium grades of paper, and is produced almost entirely at Gouverneur, in St. Lawrence County. Coke is made in by-product ovens at Tonawanda and at Syracuse from coal brought from Pennsylvania. The production of coke in 1911 was 686,172 short tons, valued at $2,883,99^, against 652,459 tons, valued at $2,635,873, in 1910. The production of aluminum, obtained by electric smelting at Niagara Falls, is one of the industries in which New York leads, but the statistics of production may not be published without divulging confidential information.

In addition to the substances discussed above New York produces feldspar, emery abrasive garnet, graphite, lime, metallic paints and other pigments, millstones, sand-lime brick, slate, infusorial earth, pyrite, quartz, and sand and gravel.

## NORTH CAROLINA.

North Carolina leads in the production of mica and of monazite, and is second in the production of barytes. The principal industry, however, based upon the value of the products obtained, is clay working. The output of the kilns make approximately 50 per cent of the State's total production. The clay products are principally common brick, with small quantities of front brick, drain tile, etc. The pottery products are red, earthen, stone, yellow, and Rockingham ware. Second in importance among the mineral products in North Carolina is building stone, composed almost entirely of granite produced in Buncombe, Mecklenburg, Rockingham, Rowan, Surry, Vance, and Warren counties, with small amounts of sandstone, marble, and limestone. The total value of the stone produced in North Carolina in 1910 was $879,572, and in 1911 it was $826,928.

The production of mica, in which the State holds the premiership, was valued at $230,460 in 1910 and in 1911 at $217,299. The mica is a white muscovite, highly prized for its transparency, and used in the manufacture of gas-lamp chimneys and lamp shades, and in the stove trade. Other products of the State are barytes, gold, copper, iron ore, lime, millstones, abrasive garnet, precious stones, mineral waters, graphite, sand-lime brick, sand and gravel, silver, talc, and soapstone. A small quantity of tin ore has been mined in the State. Some of the talc produced in North Carolina is the highest grade found in the United States, and is used for complexion powder.

The following table shows the quantity and value of the mineral products of North Carolina in 1910 and 1911:

*Mineral production of North Carolina in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Barytes..short tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Clay products..do.... | (a) (b) | (a) (b) | ..... | $1,223,664 | 14,903 | b $130,610 | ..... | $1,280,126 |
| Coal.....do.... | ..... | ..... | ..... | ..... | (a) | (a) | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 181,263 | 23,021 | ..... | ..... | 13,699 | 1,712 |
| Feldspar.short tons.. | ..... | ..... | ..... | ..... | (a) | (a) | ..... | ..... |
| Garnet, abrasive, short tons..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Gems and precious stones..... | ..... | ..... | ..... | 710 | ..... | ..... | ..... | 10,735 |
| Gold, fine ounces (troy)..... | ..... | ..... | 3,120 | 64,500 | ..... | ..... | 3,478 | 71,900 |
| Graphite, amorphous, short tons..... | ..... | ..... | ..... | ..... | (a) | (a) | ..... | ..... |
| Iron ore...long tons.. | 65,278 | $114,237 | ..... | ..... | 84,782 | 148,369 | ..... | ..... |
| Lime.....short tons.. | ..... | ..... | 9,952 | 40,455 | ..... | ..... | 7,809 | 33,543 |
| Mica..... | ..... | ..... | ..... | 230,460 | ..... | ..... | ..... | 217,299 |
| Millstones..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Mineral waters, gallons sold..... | 143,007 | 21,389 | ..... | ..... | 231,510 | 31,108 | ..... | ..... |
| Monazite and zircon, pounds..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons..... | 62,935 | 13,406 | ..... | ..... | 251,977 | 93,336 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 8,300 | 4,500 | ..... | ..... | 1,000 | 500 |
| Stone..... | ..... | (c) | ..... | c 879,572 | ..... | (c) | ..... | c 826,928 |
| Talc and soapstone, short tons..... | (c) | (c) | (a) | (a) | (c) | (c) | (a) | (a) |
| Tin (concentrates), short tons..... | ..... | ..... | 1 | 700 | ..... | ..... | ..... | ..... |
| Miscellaneous..... | ..... | 148,408 | ..... | 84,836 | ..... | 17,725 | ..... | 63,874 |
| Total value, eliminating duplications. | $2,730,818 | | | | $2,797,155 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

## NORTH DAKOTA.

The principal mineral product of North Dakota, which belongs to the Great Plains region, is lignite. It has been found to make an excellent fuel for burning brick, and the development of these two industries will probably coincide. The area underlain by lignite in North Dakota is larger than the coal area of any other State, with the exception of Montana. The lignite production of North Dakota in 1910 was 399,041 short tons, valued at $595,139, and in 1911 it was 502,628 tons, valued at $720,489. The brick made was valued at $227,455 in 1910 and at $210,616 in 1911. A small production of natural gas is made in the State. Some mineral waters are sold, and there is a small output of sand and gravel, and sand-lime brick.

The following table shows the quantity and value of the mineral products of North Dakota in 1910 and 1911:

*Mineral production of North Dakota in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | (a) (b) | (a) (b) | ..... | $227,455 | (a) (b) | (a) (b) | ..... | $210,616 |
| Coal.....short tons | 399,041 | $595,139 | ..... | ..... | 502,628 | $720,489 | ..... | ..... |
| Mineral waters, gallons sold | (b) | (b) | ..... | ..... | (b) | (b) | ..... | ..... |
| Natural gas | ..... | 7,010 | ..... | ..... | ..... | 5,738 | ..... | ..... |
| Sand and gravel, short tons | 15,886 | 11,222 | ..... | ..... | 23,160 | 15,795 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (b) | ..... | ..... | ..... | (b) |
| Miscellaneous | ..... | (c) | ..... | c 19,972 | ..... | (c) | ..... | c 5,607 |
| Total value, eliminating duplications | $860,233 | | | | $957,425 | | | |

a Value not included under total value.
b Value included under "Miscellaneous."
c Derived product includes raw product.

## OHIO.

Ohio is the premier State in the manufacture of clay products and in the manufacture of grindstones and pulpstones. It is second in the production of pig iron and lime; third in the value of its output of natural gas, salt, sand and gravel, gypsum, and oilstones; fourth in the production of coal and stone. Ohio is second among the States in the manufacture of pig iron, and although the total value of the pig-iron production approaches the combined value of all the other mineral products of the State, Ohio has no standing as a producer of iron ore. The ore used in the blast furnaces of Ohio is brought from Lake Superior. Exclusive of pig iron in 1910, the value of Ohio's mineral production was $100,004,982, and in 1911 $97,090,284. If pig iron were used as the basis of production Ohio would rank second, next to Pennsylvania, as a mineral-producing State. The production of pig iron eliminated, Ohio falls to fourth place, and West Virginia advances from fourth to third.

Of the products mined in Ohio, coal and clay are rivals for first place in the value of production. In 1909 the value of the clay production exceeded that of the coal; in 1910 coal held first place; and in 1911 the clay production again exceeded the value of coal. The production of coal in 1910 amounted to 34,209,668 short tons, valued at $35,932,288, decreasing to 30,759,986 short tons, valued at $31,810,123, in 1911. The value of the clay production on the other hand increased from $31,525,948 in 1910 to $32,663,895 in 1911. All of the coal production in Ohio is of bituminous variety, though some of it, like the block coal of Indiana, is usable raw in blast furnaces. When so used it is generally mixed with coke. The principal coal-producing counties are, in the order of their importance, Belmont, Athens, Jefferson, Guernsey, Perry, and Hocking, but

all of the counties on the east of Erie on the north and of Portsmouth on the south, with the exception of Ashtabula and Lake counties, are producers of coal. In 1882, at the beginning of this series of reports, Ohio's production of coal amounted to 9,450,000 tons. Its maximum of production was 34,209,668 short tons, which was reached in 1910.

Of the clay products, brick and tile represent about 60 per cent of the total value, and pottery about 40 per cent. In 1910, the brick and tile production of Ohio was valued at $17,231,236 and in 1911 at $17,888,630. The pottery products were worth $14,294,704 in 1910 and $14,775,265 in 1911. Sewer pipe represents the largest value in the products, with vitrified paving brick, second; common brick, third; tile (other than drain), fourth; drain tile, fifth; and fire brick, sixth. The principal producing counties are Muskingum, Summit, Stark, Jefferson, Cuyahoga, Tuscarawas, Perry, Scioto, Carroll and Athens. The pottery industry of Ohio is made up largely of the manufacture of high-grade pottery ware, most of the plants being along Ohio River, chiefly at Rookwood, near Cincinnati. Over 70 per cent of the total production of pottery in Ohio is white ware and other varieties of porcelain. Porcelain electrical supplies constitute important products.

The production of petroleum in Ohio in 1910 was 9,916,370 barrels, valued at $10,651,568; in 1911 it was 8,817,112 barrels, valued at $9,479,542. The production of natural gas was valued at $8,626,954 in 1910 and at $9,367,347 in 1911. The combined value of the fuels produced—that is, of coal, petroleum, and natural gas—was $55,210,810 in 1910 and $50,657,012 in 1911, which represents about 55 per cent of the production of the State, exclusive of pig iron. The principal petroleum-producing counties are Allen, Belmont, Carroll, Fairfield, Hancock, Harrison, Jefferson, Lucas, Monroe, Morgan, Noble, Perry, Sandusky, Seneca, Van Wert, Washington, and Wood; and the principal counties producing natural gas are Licking, Hocking, Knox, Ashland, and Fairfield.

The principal quarry production of Ohio is limestone, of which there is large quantity and great variety in this State. The use of this limestone is principally for road making, railroad ballast, and manufacture of concrete, and for iron flux. The principal producing counties are Allen, Erie, Franklin, Hamilton, Hardin, Lucas, Marion, Miami, Ottawa, Sandusky, Seneca, and Wood. The production of sandstone is equal to about one-third of that of the limestone. This is largely from the Berea sandstone which also produces the grindstones and pulpstones, in the production of which this State leads. The total value of stone produced in Ohio in 1910 was $5,759,563 and in 1911 it was $5,796,829. In the production of molding sand Ohio ranks first. This product constitutes about 25 per cent of the total sand and gravel production. All kinds of sands are produced in the State, the largest value being expressed by building sand. Gravel, used principally for railroad ballast, constitutes about 25 per cent of the sand and gravel used. The production of sand and gravel was valued in 1910 at $2,065,224 and in 1911 at $2,104,776. Other important mineral products of the State are lime, cement, salt, grindstones, pulpstones, coke (made from West Virginia coal), and gypsum. Less important products are bromine, calcium chloride, mineral waters, pyrite (as a by-product of coal mining), mineral paint, oilstones, and sand-lime brick.

The following table shows the quantity and value of the mineral products of Ohio in 1910 and 1911:

*Mineral production of Ohio in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Bromine..pounds.. | ..... | ..... | (a) | (a) | ..... | ..... | 116,872 | $17,737 |
| Calcium chloride, short tons..... | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Cement...barrels.. | ..... | ..... | 1,592,073 | $1,332,986 | ..... | ..... | 1,488,074 | 1,248,109 |
| Clay products, short tons..... | 325,308 | b $228,255 | ..... | 31,525,948 | 285,735 | b $206,668 | ..... | 32,663,895 |
| Coal....short tons.. | 34,209,668 | 35,932,288 | ..... | ..... | 30,759,986 | 31,810,123 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 282,315 | b 911,987 | ..... | ..... | 311,382 | b 961,904 |
| Ferro-alloys, long tons..... | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Grindstones and pulp stones..... | ..... | ..... | ..... | 699,033 | ..... | ..... | ..... | 742,107 |
| Gypsum, short tons | (a) | ..... | ..... | (a) | (a) | ..... | ..... | (a) |
| Iron ore..long tons.. | 22,320 | 35,866 | ..... | ..... | 16,697 | 30,549 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | 5,584,279 | b 85,385,254 | ..... | ..... | 5,371,378 | b 73,484,592 |
| Lime...short tons.. | ..... | ..... | 415,285 | 1,647,335 | ..... | ..... | 405,562 | 1,607,524 |
| Mineral paints, natural pigments, short tons..... | ..... | ..... | (a) | (a) | ..... | ..... | ..... | ..... |
| Mineral waters, gallons sold..... | 2,226,188 | 95,989 | ..... | ..... | 1,958,547 | 86,478 | ..... | ..... |
| Natural gas..... | ..... | 8,626,954 | ..... | ..... | ..... | 9,367,347 | ..... | ..... |
| Oilstones and scythestones..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Petroleum, barrels.. | 9,916,370 | 10,651,568 | ..... | ..... | 8,817,112 | 9,479,542 | ..... | ..... |
| Pyrite..long tons.. | 3,766 | 12,831 | ..... | ..... | 6,471 | 18,017 | ..... | ..... |
| Salt.....barrels.. | ..... | ..... | 3,673,850 | 951,963 | ..... | ..... | 4,302,507 | 1,100,453 |
| Sand and gravel, short tons..... | 5,106,514 | 2,065,224 | ..... | ..... | 5,281,637 | 2,104,776 | ..... | ..... |
| Sand-lime brick.... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Stone..... | ..... | 2,050,080 | ..... | 3,709,483 | ..... | (c) | ..... | c 5,796,829 |
| Sulphuric acid (60° Baumé),d short tons..... | ..... | ..... | ..... | (d) | ..... | ..... | (d) | (d) |
| Miscellaneous..... | ..... | ..... | ..... | 1,155,398 | ..... | ..... | ..... | 1,338,348 |
| Total value, eliminating duplications..... | $100,004,982 | | | | $97,090,284 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes stone sold rough.
d From zinc smelters. No report for 1910. Value included under "Miscellaneous."

## OKLAHOMA.

Since 1905 Oklahoma has increased rapidly in the production of petroleum and now ranks second among the States in that particular. Prior to 1904 the petroleum production of Oklahoma was insignificant. In that year considerable development work was done in the Osage Indian Reservation and in the vicinity of Bartlesville and Romona, in the Cherokee Nation of (then) Indian Territory. The production rose from less than 150,000 barrels in 1903 to nearly 1,400,000 barrels in 1904. By 1907 it had reached over 45,000,000 barrels, and at the present time, as the second oil producing State, Oklahoma is yielding oil at the rate of over 50,000,000 barrels annually. In 1910 the petroleum production of Oklahoma was 52,028,718 barrels, valued at $19,922,660; in 1911 it was 56,069,637 barrels, valued at $26,451,767. The value of the petroleum production is about 60 per cent of the total mineral output of the State.

The great increase in the production of petroleum, used largely for fuel, has naturally retarded the development of the coal resources of the State. According to the Tenth United States Census, 120,947 tons of coal were mined in Oklahoma (Indian Territory) in 1880, this being the first record of any coal produced in the then Territory. Coal production increased nearly every year until 1903, when it reached 3,517,388 tons. At this date the influence of petroleum, and of natural gas also, began to be felt, and coal mining has been practically at a standstill ever since. In only one year since has the production exceeded that of 1903, and this was in the boom period of 1907. The average yearly production from 1904 to 1911, inclusive, has been nearly half a million tons less than that of 1903. The production in 1911 was 3,074,242 short tons, valued at $6,291,494, against 2,646,226 tons, valued at $5,867,947, in 1910. The output in 1910 was cut down to an unusual extent by the strike of miners in all the Mississippi Valley States. Prior to the admission of Oklahoma as a State, the principal part of the production of coal was from the Choctaw Nation, with smaller quantities from the Cherokee and Creek Nations. Pittsburg County is now the leading producer, with Coal, Latimer, Okmulgee, and Haskell counties following in the order named. Four other counties also produce coal.

The following table shows the quantity and value of the mineral products of Oklahoma in 1910 and 1911:

*Mineral production of Oklahoma in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asphalt..short tons.. | 11,959 | $65,244 | ..... | ..... | (a) | (a) | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products..... | ..... | ..... | ..... | $920,921 | ..... | ..... | ..... | $756,639 |
| Coal.....short tons.. | 2,646,226 | 5,867,947 | ..... | ..... | 3,074,242 | $6,291,494 | ..... | ..... |
| Coke.....do.... | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | ..... | ..... |
| Gypsum .short tons.. | 162,788 | ..... | ..... | 459,137 | 108,653 | ..... | ..... | 293,302 |
| Lead.....do.... | ..... | ..... | 1,805 | 158,840 | ..... | ..... | 1,925 | 173,250 |
| Lime.....do.... | ..... | ..... | 2,140 | 9,700 | ..... | ..... | 3,472 | 14,603 |
| Mineral waters, gallons sold..... | 115,000 | 4,950 | ..... | ..... | 497,074 | 14,290 | ..... | ..... |
| Natural gas..... | ..... | 3,490,704 | ..... | ..... | ..... | 6,731,770 | ..... | ..... |
| Petroleum...barrels.. | 52,028,718 | 19,922,660 | ..... | ..... | 56,069,637 | 26,451,767 | ..... | ..... |
| Pyrite....long tons.. | ..... | ..... | ..... | ..... | (a) | (a) | ..... | ..... |
| Salt.....barrels.. | ..... | ..... | 2,564 | 881 | ..... | ..... | 500 | 431 |
| Sand and gravel, short tons..... | 650,236 | 186,977 | ..... | ..... | 291,424 | 97,539 | ..... | ..... |
| Stone..... | ..... | 129,174 | ..... | 502,537 | ..... | (c) | ..... | c 795,879 |
| Zinc.....short tons.. | ..... | ..... | 2,297 | 248,076 | ..... | ..... | 2,247 | 256,158 |
| Miscellaneous..... | ..... | ..... | ..... | 1,032,417 | ..... | (c) | ..... | c 801,324 |
| Total value, eliminating duplications. | $32,988,865 | | | | $42,678,446 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

Natural gas ranks second in value among the mineral products of Oklahoma, the output in 1910 being valued at $3,490,704, and in 1911 at $6,731,770. The three fuels considered by value make up 90 per cent of the total mineral production of the State.

The clay products are chiefly common and vitrified brick, the total value in 1910 being $920,921, and in 1911, $756,639. The principal counties in this regard are Muskogee, Rogers, and Tulsa.

The chief quarry product is limestone, about two-thirds of which is crushed for railroad ballast and concrete. The quarrying of granite, chiefly for building, is also of considerable importance in Greer, Johnston, Kiowa, and Sequoyah counties. The total stone production of the State was valued at $795,879 in 1911, against $631,711 in 1910.

Other mineral products to which Oklahoma contributes are asphalt, cement, gypsum, lead, lime, mineral waters, salt, sand, gravel, and zinc.

## OREGON.

Oregon has not risen to much prominence as a mining State, its production of only two substances attaining as much as $1,000,000 in value. Clay products, principally common and pressed brick, were valued at $1,081,025 in 1911, exclusive of a small output of pottery. The stone production was valued at $1,108,478 in 1910 but only $583,398 in 1911. In 1910 the clay products were valued at $876,632. The gold production of the State was $681,400 in 1910 and $634,200 in 1911. Sand (chiefly building) and gravel had a combined value of $625,405 in 1910 and of $659,417 in 1911. Some coal (lignite) has been produced in Coos County for a good many years, but the competition of fuel oil from California has taken away its chief market in San Francisco. Production has decreased from 87,276 tons in 1909 to 67,533 tons in 1910 and to 46,661 tons in 1911. Other products of the State are copper, lead, gypsum, lime, mineral waters, platinum, precious stones (irregularly), ocher, pottery, and silver.

The following table shows the quantity and value of the mineral products of Oregon in 1910 and 1911:

*Mineral production of Oregon in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products, short tons | (a) (c) | (a) (c) | ..... | b $876,632 | 1,283 | a $7,053 | ..... | b$1,081,025 |
| Coal.....short tons | 67,533 | $235,229 | ..... | ..... | 46,661 | 108,033 | ..... | ..... |
| Copper.....pounds | ..... | ..... | 22,022 | 2,797 | ..... | ..... | 125,943 | 15,743 |
| Gems and precious stones | ..... | ..... | ..... | 100 | ..... | ..... | ..... | 50 |
| Gold, fine ounces (troy) | ..... | ..... | 32,963 | 681,400 | ..... | ..... | 30,679 | 634,200 |
| Gypsum.short tons | 12,699 | ..... | ..... | 62,984 | ..... | ..... | ..... | ..... |
| Lead.....do | ..... | ..... | ..... | ..... | ..... | ..... | 11 | 990 |
| Lime.....do | ..... | ..... | 6,742 | 65,039 | ..... | ..... | 4,557 | 38,216 |
| Mineral paints, natural pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | ..... | ..... |
| Mineral waters, gallons sold | 88,970 | 22,989 | ..... | ..... | 56,300 | 18,000 | ..... | ..... |
| Platinum, fine ounces (troy) | ..... | ..... | 53 | 1,121 | ..... | ..... | 117 | 3,265 |
| Sand and gravel, short tons | 1,432,495 | 625,405 | ..... | ..... | 1,438,504 | 659,417 | ..... | ..... |
| Silver, fine ounces (troy) | ..... | ..... | 43,800 | 23,600 | ..... | ..... | 44,800 | 24,200 |
| Stone | ..... | (d) | ..... | d1,108,478 | ..... | (d) | ..... | d 583,398 |
| Miscellaneous | ..... | ..... | ..... | 34,403 | ..... | ..... | ..... | 32,259 |
| Total value, eliminating duplications | $3,739,927 | | | | $3,198,796 | | | |

a Value not included in total value.
b Exclusive of pottery, which is included under "Miscellaneous."
c Value included under "Miscellaneous."
d Derived product includes stone sold rough.

## PENNSYLVANIA.

Since the first records of mining statistics were written into the history of the United States, Pennsylvania has stood at the top of the list. Exclusive of the value of pig iron and of coke and of other derived or secondary products not included in the total made in the State, the value of Pennsylvania's mineral production is nearly one-fourth of that of the entire country, and exceeds by several million dollars the combined output of Illinois, Ohio, West Virginia, and California, the next four States in the value of their mineral production. The total value of the mineral production of Pennsylvania was $411,827,343 in 1910 and $414,112,373 in 1911. Pennsylvania holds the leadership primarily on account of the State's supremacy in the production of coal. In the combined value of the production of anthracite and bituminous coal Pennsylvania exceeds the aggregate value of all the mineral products of Illinois, West Virginia, and Ohio, the second, third, and fourth States, respectively, in rank. In addition to being the premier State in the production of coal, Pennsylvania leads also in the production of cement, lime, mineral paints, sand, slate, and stone, and in the manufacture of coke and pig iron. It is second in the value of clay products, of feldspar, graphite, and natural gas.

The production of coal in Pennsylvania in 1910 amounted to 235,006,762 short tons, valued at $313,304,812, of which 84,485,236 short tons, valued at $160,275,302, were anthracite and 150,521,526 short tons, valued at $153,029,510, were bituminous coal. In 1911 the production of bituminous coal decreased to 144,754,163 short tons, valued at $146,347,858, while that of anthracite increased to 90,464,067 short tons, valued at $175,189,392, so that whereas the total quantity increased only 211,468 tons to 235,218,230 tons, the value increased $8,232,438 to $321,537,250, owing to the higher value of anthracite, whose production increased approximately 6,000,000 tons while that of the lower priced bituminous coal decreased about the same quantity. As is well known, the entire production of anthracite is from a limited area, less than 500 square miles in extent, in the eastern part of the State. Ten counties contribute to the production, but 80 per cent or more of the total is mined in three counties: Luzerne, whose output exceeds 30,000,000 short tons a year, Lackawanna, which exceeds 20,000,000 tons, and Schuylkill, which produces from 16,000,000 to 18,000,000 tons. Northumberland County produces over 6,000,000 tons, Carbon over 3,000,000 tons, and about 3,000,000 tons is made up of the combined product of Columbia, Dauphin, Sullivan, Susquehanna, and Wayne counties. The bituminous coal fields extend over the greater part of the western half of the State and have a total area of more than 14,000 square miles. About 70 per cent of the production is from five counties: Fayette, whose maximum production in 1910 was over 31,000,000 tons, Westmoreland, whose production has reached (in 1907) nearly 29,000,000 tons, Allegheny, which approaches 19,000,000 tons, Washington and Cambria, each exceeding 16,000,000 tons. Three other counties, Clearfield, Indiana, and Somerset, have produced over 8,000,000 tons a year; one, Jefferson, exceeds 5,000,000 tons; one, Armstrong, has produced over 3,000,000 tons; and five others, Butler,

Center, Clarion, Elk, and Tioga, have mined over 1,000,000 tons. The first two counties, Fayette and Westmoreland, contain the famous Connellsville and Lower Connellsville coking coals, the fuel that makes that region the greatest coke-making district in the world.

Pennsylvania produces little iron ore, but the city of Pittsburgh and vicinity is the greatest iron-making district of the world. In 1910 Pennsylvania produced 739,799 long tons of iron ore, valued at $911,847, and in 1911, 514,929 tons, valued at $539,553. The production of pig iron (almost entirely from Lake Superior ores) was 11,014,652 long tons, valued at $174,486,833, in 1910, and 9,581,109 tons, valued at $136,328,507, in 1911.

The Lehigh cement district of eastern Pennsylvania (with a few plants in New Jersey) is the most important cement-making region in the world. The principal producing center is in the vicinity of Allentown. The Lehigh district as a whole makes about one-third the entire cement production of the United States, and it properly includes the counties of Northampton, Carbon, Lehigh, and Berks in Pennsylvania, and Hunter County in New Jersey. Other plants in Pennsylvania are located at York, Pittsburgh, Wampum, and Newcastle. The total production of cement in Pennsylvania in 1910 was 26,872,309 barrels, valued at $19,608,045, and 27,024 725 barrels, valued at $19,306,349, in 1911, of which nearly 90 per cent was from the Pennsylvania portion of the Lehigh district.

The clay products of Pennsylvania were valued at $22,094,285 in 1910 and at $20,270,033 in 1911. Pennsylvania ranks second among the States in the total value of its clay products, and first in the manufacture of the more ordinary types, such as brick of different kinds, terra cotta, tile, etc. In the output of pottery, New Jersey, Ohio, and West Virginia all exceed Pennsylvania. Expressed in value the output of fire brick is the most important of the clay products of Pennsylvania, the State's production of fire brick being more than one-third of the entire production of the United States, and about one-third of the value of all the brick and tile products in the State. The value of the fire brick produced in 1910 in Pennsylvania was $6,454,928, and in 1911 it was $5,555,529. Common brick is second in importance among the clay products, and the State's production was valued at $5,371,707 in 1910, and at $4,963,232 in 1911; front brick had a value of $2,001,967 in 1910 and of $2,111,492 in 1911; and vitrified brick in 1910 was valued at $1,204,724 and in 1911 at $1,511,061. All classes of brick, tile, and terra cotta are made in Pennsylvania, and the total value of this class of clay production in 1910 was $19,814,355 and in 1911 $18,113,216. The pottery products also include most of the varieties produced in the United States, valued at $2,279,930 in 1910 and at $2,156,817 in 1911. The principal clay-producing counties in the State are Philadelphia, Clearfield, Allegheny, Cambria, Beaver, Huntingdon, Armstrong, Elk, Clinton, and Lawrence.

Pennsylvania gave place in 1910 to West Virginia as first in rank in the value of the natural gas produced, but continues to rank first in consumption, both in quantity and value, of this fuel, making out the shortage in its own production by drawing from the West Virginia wells. West Virginia has exceeded Pennsylvania in the quantity of gas produced for several years. In 1910 the production of

natural gas in Pennsylvania fell off about 1,000,000,000 cubic feet, and that of West Virginia increased nearly 25,000,000,000 cubic feet, and the latter State exceeded Pennsylvania in the value of its natural gas production for the first time in its history. In 1911, West Virginia added over 16,000,000,000 cubic feet to its production while Pennsylvania fell off nearly 23,000,000,000 cubic feet, and in the value of its production West Virginia exceeded Pennsylvania over $10,000,000. West Virginia, however, consumes considerably less than one-half of the gas produced in the State, about three-fifths of its output being piped into Pennsylvania and Ohio for consumption.

Up to 1894 Pennsylvania was the leading State in the production of petroleum. In 1895 it was exceeded by Ohio, the production in Pennsylvania having begun to decline in 1891, while Ohio was approaching its maximum, which was attained in 1896. Both States have shown a declining tendency in the last 15 years. In more recent years West Virginia, Texas, California, Illinois, and Oklahoma have risen rapidly in the production of petroleum, and now Pennsylvania ranks eighth in the quantity of its oil production and fifth in the value.

The production of limestone is the principal factor in giving Pennsylvania first place as a producer of stone. Pennsylvania is also the first in the production of slate, of sand and gravel, and of lime. In 1910 the total value of the stone quarried in Pennsylvania was $8,571,518 and in 1911 it was $8,147,505; of this the production of limestone in 1910 was valued at $5,394,611 and in 1911 at $5,243,045.

The principal use of the limestone is for fluxing in the furnaces around Pittsburgh and Johnstown, and in the eastern and central parts of the State about 70 per cent of the total value of the limestone being used for this purpose. Next in importance to limestone is sandstone, which was valued at $1,595,070 in 1910 and at $1,333,309 in 1911. Trap rock, granite, and marble are also quarried. The principal leading counties in trap rock are Berks, Bucks, Delaware, and Montgomery; in granite, Berks, Bucks, Chester, Delaware, Lancaster, Lehigh, Montgomery, and Philadelphia; in marble, Chester, Luzerne, Montgomery, Northampton, and York. In the production of slate Pennsylvania is credited with about 60 per cent of the total output of the United States. In 1910 the State's production was valued at $3,740,806 out of a total for the United States of $6,236,759, and in 1911 at $3,431,351 out of a total of $5,728,019. The principal slate-producing region of the State is in Northampton and Lehigh counties. York is next in importance, producing the famous Peach Bottom slate. Smaller quantities are produced in Carbon and Lancaster counties.

Pennsylvania has more than one-half the total number of lime producers in the United States, but its production is about 25 per cent in quantity and 20 per cent in value of the total output. In 1910 the lime production in Pennsylvania was 877,714 short tons, valued at $2,440,350, and in 1911 it was 841,723 short tons, valued at $2,688,374. The burning of lime is an industry which is scattered pretty well all over the State. The combined production of sand and gravel in Pennsylvania in 1910 was 5,676,509 short tons, valued at $2,974,221, and in 1911 it was 5,689,059 tons, valued at $3,025,267.

In the manufacture of coke, as in the production of coal and in the manufacture of pig iron, Pennsylvania ranks preeminently above all the other States, with 60 per cent of the total production of coke. Owing to the slump in iron ore the manufacture of coke declined from 26,315,607 short tons, valued at $55,254,599, in 1910, to 21,923,935 short tons, valued at $43,053,367, in 1911. The principal counties, as is well known, that lead in the production of coke are Fayette and Westmoreland, and the districts of Connellsville and Lower Connellsville. Cambria, Clearfield, and Indiana are also important counties in the manufacture of coke.

The other mineral products of Pennsylvania are copper, feldspar, precious stones, gold, graphite, mineral paints, limestone, millstones, mineral waters, bromine, pyrite, quartz, salt, sand-lime brick, talc, and zinc oxide.

The following table gives the mineral production of Pennsylvania during 1910 and 1911:

*Mineral production of Pennsylvania in 1910 and 1911.*

| Product. | 1910 | | | |
|---|---|---|---|---|
| | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Valve. |
| Abrasives, artificial.....pounds.. | ..... | ..... | (a) (b) | (a) (b) |
| Briquets, fuel.....short tons.. | ..... | ..... | (c) | (c) |
| Bromine.....pounds.. | ..... | ..... | (b) | (b) |
| Calcium chloride.....short tons.. | ..... | ..... | (b) | (b) |
| Cement.....barrels.. | ..... | ..... | d 26,872,309 | d $19,608,045 |
| Clay products.....short tons.. | 396,238 | a $636,613 | ..... | 22,094,285 |
| Coal: | | | | |
| Anthracite.....do.... | 84,485,236 | 160,275,302 | ..... | ..... |
| Bituminous.....do.... | 150,521,526 | 153,029,510 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 26,315,607 | a 55,254,599 |
| Copper.....pounds.. | ..... | ..... | 740,626 | 94,060 |
| Feldspar.....short tons.. | 15,091 | 104,751 | ..... | ..... |
| Ferro-alloys.....long tons.. | ..... | ..... | (a) (b) | (a) (b) |
| Gems and precious stones..... | ..... | ..... | ..... | ..... |
| Gold.....fine ounces (troy).. | ..... | ..... | (b) | (b) |
| Graphite, crystalline.....pounds.. | 1,392,767 | 82,194 | ..... | ..... |
| Iron ore.....long tons.. | 739,799 | 911,847 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | 11,014,652 | a 174,486,833 |
| Lime.....short tons.. | ..... | ..... | 877,714 | 2,440,350 |
| Millstones..... | ..... | ..... | ..... | (b) |
| Mineral paints, natural pigments...short tons.. | ..... | ..... | 28,091 | 265,559 |
| Zinc-lead pigments.....do.... | ..... | ..... | (b) | (b) |
| Mineral waters.....gallons sold.. | 2,536,337 | 221,685 | ..... | ..... |
| Natural gas..... | ..... | 21,057,211 | ..... | ..... |
| Petroleum.....barrels.. | 8,794,662 | 11,908,914 | ..... | ..... |
| Pyrite.....long tons.. | ..... | ..... | ..... | ..... |
| Quartz.....short tons.. | (b) | (b) | ..... | ..... |
| Sand and gravel.....do.... | 5,676,509 | 2,974,221 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | 72,827 |
| Salt.....barrels.. | ..... | ..... | (b) | (b) |
| Silver.....fine ounces (troy).. | ..... | ..... | (b) | (b) |
| Slate..... | ..... | ..... | ..... | 3,740,806 |
| Stone..... | ..... | (e) | ..... | e 8,571,518 |
| Sulphuric acid (60° Baumé)f.....short tons.. | ..... | ..... | ..... | (c) |
| Talc.....do.... | (e) | (e) | (b) | (b) |
| Miscellaneous..... | ..... | (e) | ..... | e 9,229,525 |
| Total value, eliminating duplications..... | $411,827,343 | | | |

a Value not included in total value.
b Value included under "Miscellaneous."
c No report for 1910.
d Exclusive of puzzolan cement, which is included under "Miscellaneous."
e Derived product includes raw product.
f From zinc smelters. Value included under "Miscellaneous."

*Mineral production of Pennsylvania in 1910 and 1911*—Continued.

| Product. | 1911 | | | |
|---|---|---|---|---|
| | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. |
| Abrasives, artificial.....pounds.. | ..... | ..... | (a) (b) | (a) (b) |
| Briquets, fuel.....short tons.. | ..... | ..... | 94,426 | a $223,613 |
| Bromine.....pounds.. | ..... | ..... | (b) | (b) |
| Calcium chloride.....short tons.. | ..... | ..... | (b) | (b) |
| Cement.....barrels.. | ..... | ..... | 27,024,725 | 19,306,349 |
| Clay products.....short tons.. | 329,197 | a $567,622 | ..... | 20,270,033 |
| Coal: | | | | |
| Anthracite.....do.... | 90,464,067 | 175,189,392 | ..... | ..... |
| Bituminous.....do.... | 144,754,163 | 146,347,858 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 21,923,935 | a 43,053,367 |
| Copper.....pounds.. | ..... | ..... | 661,621 | 82,703 |
| Feldspar.....short tons.. | 13,284 | 101,090 | ..... | ..... |
| Ferro-alloys.....long tons.. | ..... | ..... | (a) (b) | (a) (b) |
| Gems and precious stones..... | ..... | ..... | ..... | 300 |
| Gold.....fine ounces (troy).. | ..... | ..... | (b) | (b) |
| Graphite, crystalline.....pounds.. | (b) | (b) | ..... | ..... |
| Iron ore.....long tons.. | 514,929 | 539,553 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | 9,581,109 | a 136,328,507 |
| Lime.....short tons.. | ..... | ..... | 841,723 | 2,688,374 |
| Millstones..... | ..... | ..... | ..... | (b) |
| Mineral paints, natural pigments...short tons.. | ..... | ..... | 26,749 | 262,520 |
| Zinc-lead pigments.....do.... | ..... | ..... | (b) | (b) |
| Mineral waters.....gallons sold.. | 2,327,732 | 216,819 | ..... | ..... |
| Natural gas..... | ..... | 18,010,796 | ..... | ..... |
| Petroleum.....barrels.. | 8,248,158 | 10,894,074 | ..... | ..... |
| Pyrite.....long tons.. | (b) | (b) | ..... | ..... |
| Quartz.....short tons.. | (b) | (b) | ..... | ..... |
| Sand and gravel.....do.... | 5,689,059 | 3,025,267 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | (b) |
| Salt.....barrels.. | ..... | ..... | (b) | (b) |
| Silver.....fine ounces (troy).. | ..... | ..... | (b) | (b) |
| Slate..... | ..... | ..... | ..... | 3,431,351 |
| Stone..... | ..... | (c) | ..... | c 8,147,505 |
| Sulphuric acid (60° Baumé)d.....short tons.. | ..... | ..... | (d) | (d) |
| Talc.....do.... | (c) | (c) | (b) | (b) |
| Miscellaneous..... | ..... | 99,147 | ..... | 11,101,415 |
| Total value, eliminating duplications..... | $414,112,373 | | | |

a Value not included in total value.
b Value included under "Miscellaneous."
c Derived product includes raw product.
d From zinc smelters. Value included under "Miscellaneous."

## RHODE ISLAND.

The only products which Rhode Island has contributed during the last few years are stone, mineral waters, lime, talc, soapstone, and manufactures of clay.

The coal deposits of Rhode Island, which furnished fuel some years ago, have not recently been operated. This coal is of a highly refractory character and is more of a graphitic nature than anthracite, but it is generally designated "Rhode Island anthracite." During 1911 steps were taken to reopen one of these old mines at Portsmouth, but up to the close of the year no commercial production was reported. Some of this graphitic coal has been mined for use as furnace linings. On account of the fact that there are less than three operators in each of the other few industries in the State, mineral waters and stone are the only products that can be mentioned separately. The sales of mineral water in 1910 amounted to 528,725 gallons, valued at $34,703, and in 1911 to 503,360 gallons, valued at $27,036. The stone production was valued at $521,889 in

1910 and at $958,753 in 1911. The combined value of the other mineral products was $243,911 in 1910 and $158,686 in 1911.

The following table gives the quantity and value of the mineral production of Rhode Island for 1910 and 1911:

*Mineral production of Rhode Island in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Clay products | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (c) |
| Lime.....short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Mineral waters, gallons sold | 528,725 | $34,703 | ..... | ..... | 503,360 | $27,036 | ..... | ..... |
| Stone | ..... | (d) | ..... | d$521,889 | ..... | (d) | ..... | d $958,753 |
| Talc.....short tons | ..... | ..... | (c) | (c) | (d) | (d) | (c) | (c) |
| Miscellaneous | ..... | ..... | ..... | 243,911 | ..... | ..... | ..... | 158,686 |
| Total value, eliminating duplications | $800,503 | | | | $1,088,475 | | | |

a No report for 1910.
b Value not included in total value.
c Value included under "Miscellaneous."
d Derived product includes raw product.

## SOUTH CAROLINA.

The most important mineral industry in South Carolina is the mining of phosphate rock. This does not have the same actual or relative importance at the present time that it did in the latter years of the last century. Until the discovery of the phosphate beds in Florida in 1888 South Carolina enjoyed practically a monopoly in the production of phosphate rock. With the development of the more extensive beds in Florida, South Carolina soon lost its supremacy in the production of this substance. In 1894 the production of rock in Florida exceeded that of South Carolina, and the former State has continued to hold first place since that time. Two varieties of phosphate rock were produced in South Carolina, known as land rock and river rock, the names indicating the sources from which the rock was obtained. The river-bed deposits have practically been worked out and the land deposits are approaching exhaustion. In 1893 the production of phosphate rock in South Carolina reached its maximum, when the production was 502,564 long tons. In 1910 there were 179,659 long tons, valued at $733,057, and in 1911 169,156 long tons, valued at $673,156. South Carolina now ranks third as the producer of phosphate rock, being exceeded not only by Florida but by Tennessee. The discovery of the phosphatic character of the Tennessee deposits was not made until in 1894, and the production of South Carolina fell behind Tennessee in 1898.

The only other industry of considerable importance in South Carolina is clay working, of which the brickyards furnish by far the greater part of the output. In 1910 the value of all the clay products of South Carolina was $704,590, of which $657,801 was the value of common brick. In 1911 the total value of the clay products was $669,794, of which common brick represented $624,103. South Caro-

lina is one of three States to produce a peculiar quality of clay used in the paper trade and known as "paper clay." None of this production, however, is used within the State, but is shipped to paper manufacturers in the North. The production of "paper clay" in South Carolina in 1910 was 29,051 short tons, valued at $118,926, out of a total production of raw clay amounting to 29,920 short tons, valued at $122,567. In 1911 the quantity of raw clay mined and sold as such was 31,585 short tons, valued at $124,063, of which 30,640 short tons, valued at $120,012, was used as paper clay. The entire output of paper clay reported was from Aiken County alone.

South Carolina is one of two States in which monazite has been produced in commercial quantities, the other and more important producer being North Carolina. The production in the two States has exceeded 1,500,000 pounds and the value has exceeded $160,000, but during the last two years on account of heavy imports from Brazil the production in both States has practically ceased. In 1909 the total production of monazite in North Carolina and South Carolina was 541,931 pounds, valued at $65,032; in 1910 it was 15,847 pounds, valued at $1,902; and in 1911 no commercial production was reported, though a few thousand pounds of crude sand were mined and stocked.

The production of gold in South Carolina in 1910 was 1,829 fine ounces, valued at $37,800, and in 1911 it was 972 fine ounces, valued at $20,100. The Haile gold mine, in Lancaster County, has been the chief source of South Carolina's gold production. Other mineral products of the State are mica, mineral waters, lime, stone, sand, and gravel. The stone production, which is almost entirely granite, was valued at $369,448 in 1910, and at $194,598 in 1911.

The following table gives the quantity and value of mineral production of South Carolina in 1910 and 1911:

*Mineral production of South Carolina in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Barytes..short tons.. | ..... | ..... | ..... | ..... | (a) | (a) | ..... | ..... |
| Clay products, short tons..... | 29,920 | b$122,567 | ..... | $704,590 | 31,585 | b$124,063 | ..... | $669,794 |
| Fuller's earth, short tons..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Gold, fine ounces (troy)..... | ..... | ..... | 1,829 | 37,800 | ..... | ..... | 972 | 20,100 |
| Lime.....short tons.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Mica..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | ..... |
| Mineral waters, gallons sold..... | 410,691 | 78,465 | ..... | ..... | 285,389 | 42,099 | ..... | ..... |
| Monazite....pounds.. | (a) | (a) | ..... | ..... | ..... | ..... | ..... | ..... |
| Phosphate rock, long tons..... | 179,659 | 733,057 | ..... | ..... | 169,156 | 673,156 | ..... | ..... |
| Sand and gravel, short tons..... | 504,282 | 52,918 | ..... | ..... | 227,612 | 30,303 | ..... | ..... |
| Stone..... | ..... | (c) | ..... | c 369,855 | ..... | (c) | ..... | c 336,467 |
| Miscellaneous..... | ..... | 3,902 | ..... | 40,784 | ..... | (c) | ..... | c 32,196 |
| Total value, eliminating duplications.. | | $2,021,371 | | | | $1,804,115 | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

## SOUTH DAKOTA.

The chief mining district of South Dakota is in the Black Hills region in Lawrence County, and the mainstay of the State, from a mining standpoint, is the production of gold, in which South Dakota ranks fifth among the States. In 1910 the production of gold in South Dakota, most of which was from the Homestake mine of the Black Hills region, was 260,267 fine ounces, valued at $5,380,200. In 1911 it was 359,402 fine ounces, valued at $7,429,500. The value of the gold represents 90 per cent of the total mineral output of South Dakota. Other branches of the mining industry fall into insignificance.

In one respect, however, South Dakota practically stands alone, and that is that in both 1909 and 1910 there was some production of tin, but none in 1911. A small quantity is also reported to have been mined in North Carolina, and prospects of tin production are held out in the Territory of Alaska.

Second in importance among the mineral products of the State is that of quartzite, a hard variety of sandstone used largely for building and paving. In 1910 the stone production was valued at $173,726, decreasing to $148,190 in 1911. The production of silver was 120,600 fine ounces, valued at $65,100, in 1910, and 200,300 fine ounces, valued at $108,200, in 1911.

The following table gives the quantity and value of the mineral production of South Dakota in 1910 and 1911:

*Mineral production of South Dakota in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Clay products | ..... | ..... | ..... | $71,200 | ..... | ..... | ..... | $61,365 |
| Copper.....pounds | ..... | ..... | 43 | 5 | ..... | ..... | 1,607 | 201 |
| Gems and precious stones | ..... | ..... | ..... | 2,537 | ..... | ..... | ..... | 1,644 |
| Gold, fine ounces (troy) | ..... | ..... | 260,267 | 5,380,200 | ..... | ..... | 359,402 | 7,429,500 |
| Gypsum .short tons | (a) | ..... | ..... | (a) | (a) | ..... | ..... | (a) |
| Lead.....do | ..... | ..... | 7 | 616 | ..... | ..... | 33 | 2,970 |
| Lime.....do | ..... | ..... | 4,151 | 25,399 | ..... | ..... | 5,293 | 37,573 |
| Lithium.....do | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Mica | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Mineral waters, gallons sold | (a) | (a) | ..... | ..... | 13,400 | $2,410 | ..... | ..... |
| Natural gas | ..... | $31,999 | ..... | ..... | ..... | 16,984 | ..... | ..... |
| Sand and gravel, short tons | 849,800 | 157,738 | ..... | ..... | 92,757 | 41,286 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (a) | ..... | ..... | ..... | 31,535 |
| Silver, fine ounces (troy) | ..... | ..... | 120,600 | 65,100 | ..... | ..... | 200,300 | 108,200 |
| Stone | ..... | 43,058 | ..... | 130,668 | ..... | (b) | ..... | b 148,190 |
| Tin.....short tons | ..... | ..... | 18 | 12,600 | ..... | ..... | ..... | ..... |
| Tungsten ore (60 per cent concentrates, short tons | ..... | ..... | 300 | 64 | ..... | ..... | ..... | ..... |
| Miscellaneous | ..... | 4,091 | ..... | 170,539 | ..... | (b) | ..... | b 155,514 |
| Total value, eliminating duplications | | $6,095,814 | | | | $8,037,372 | | |

a Value included under "Miscellaneous." b Derived product includes raw product.

The clay products consist principally of common brick, with smaller portions of front brick, drain tile, and fire brick, which amounted to $71,200 in 1910 and to $61,365 in 1911. Other less important products are cement, copper, gypsum, lead, lime, mica, mineral waters, natural gas, sand-lime brick, sand and gravel, and tungsten ore.

## TENNESSEE.

The most important mineral resource of Tennessee is coal, the value of the output of which is equal to 40 per cent of the State's total mineral production. Exclusive of the value of pig iron made in the State, but including the value of the iron ore mined, the total value of the mineral products of Tennessee in 1910 was $17,150,742, and in 1911 it was $17,902,451. Of these totals the coal produced in 1910 contributed $7,925,350 (7,121,380 short tons), and in 1911, $7,209,734 (6,433,156 short tons). All of the coal-producing counties are in the eastern part of the State, which is crossed in a northeast-southwest direction by the coal areas of the Appalachian system. The three principal producing counties, Campbell, Claiborne, and Anderson, are at the northern end of the Tennessee coal field. This section produces the celebrated Jellico coal, highly prized as a steam and domestic fuel. Other important coal-producing counties are Marion, Morgan, Scott, White, Grundy, and Hamilton. All of the coal produced in the State is bituminous in character, some of it possessing excellent coking quality. Coke is made in six counties and is consumed in the iron furnaces at Rockwood, at Dayton, and in the vicinity of Chattanooga.

Tennessee's production of pig iron amounted to 400,269 long tons, valued at $5,199,099, in 1910 and to 297,594 long tons, valued at $3,439,644, in 1911, mostly from ore mined within the State. In 1910 the iron ore produced in Tennessee amounted to 732,247 long tons, valued at $1,048,323, and in 1911 it was 469,728 tons, valued at $632,339. The iron ore occurs in close proximity to the coking coals and is mined chiefly in Roane, Lawrence, Hickman, and Wayne counties.

In the production of copper Tennessee is the only one of importance among the Eastern States, and ranks seventh in this respect among all the States, though when compared with the great copper production of Michigan, Montana, and Arizona, the output of Tennessee appears unimportant. The entire production of the State is from pyritic ores mined in Polk County and smelted at Ducktown. The production in 1911 was 18,965,143 pounds, valued at $2,370,643, against 16,691,777 pounds, valued at $2,119,856, in 1910. The agitation in the last few years against the emission of sulphur-laden fumes from the smelter stacks and the efforts of the operators to control them have resulted in the construction of a plant for the recovery in the form of acid of the sulphur contained in the ore. Work on this plant was begun in 1906, but was not in full operation until in 1908; it was enlarged in 1910, and now has a capacity of from 180,000 to 200,000 tons of 60° Baumé acid annually. The operations of this plant are described in considerable detail in the report on sulphur, pyrite, and sulphuric acid in Part II of the present report.

The discovery in 1894 of extensive beds of phosphate rock in Tennessee has developed into an industry now fourth in importance among

the mining and related enterprises of the State, and Tennessee now ranks second among the States in the production of this mineral substance, with an output exceeding $1,500,000 in value. The deposits occur in the central part of the State in Hickman, Maury, Williamson, Perry, and Lewis counties, and are of three types, brown, blue, and white rock, the first being by far the most important commercially. The production of phosphate rock in Tennessee was 398,188 long tons, valued at $1,503,350, in 1910 (including a small quantity from Arkansas) and 431,566 tons, valued at $1,688,267, in 1911.

The following table gives the quantity and value of the mineral products of Tennessee during 1910 and 1911:

*Mineral production of Tennessee in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Barytes..short tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Bauxite...long tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons..... | 61,407 | b $120,753 | ..... | $1,414,288 | 49,653 | b $104,277 | ..... | $1,385,100 |
| Coal.....short tons.. | 7,121,380 | 7,925,350 | ..... | ..... | 6,433,156 | 7,209,734 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 322,756 | b 959,104 | ..... | ..... | 330,418 | b 797,758 |
| Copper.....pounds.. | ..... | ..... | 16,691,777 | 2,119,856 | ..... | ..... | 18,965,143 | 2,370,643 |
| Ferro-alloys, long tons..... | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Gold, fine ounces (troy)..... | ..... | ..... | 135 | 2,800 | ..... | ..... | 576 | 11,900 |
| Iron ore...long tons.. | 732,247 | 1,048,323 | ..... | ..... | 469,728 | 632,339 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | 400,269 | b 5,199,099 | ..... | ..... | 297,594 | b 3,439,644 |
| Lime....short tons.. | ..... | ..... | 88,679 | 275,701 | ..... | ..... | 91,099 | 282,763 |
| Mineral paints, natural pigments, short tons..... | ..... | ..... | 4,584 | 38,194 | ..... | ..... | (a) | (a) |
| Mineral waters, gallons sold..... | 950,511 | 71,129 | ..... | ..... | 1,073,115 | 72,475 | ..... | ..... |
| Natural gas..... | ..... | 300 | ..... | ..... | ..... | 300 | ..... | ..... |
| Phosphate rock, long tons..... | (a) | (a) | ..... | ..... | 431,566 | 1,688,267 | ..... | ..... |
| Quartz...short tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons..... | 795,412 | 417,901 | ..... | ..... | 1,117,309 | 518,542 | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 69,800 | 37,700 | ..... | ..... | 107,000 | 57,800 |
| Slate..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | ..... |
| Stone..... | ..... | (c) | ..... | c 1,455,482 | ..... | (c) | ..... | c 1,498,798 |
| Sulphuric acid (60° Baumé), d short tons..... | ..... | ..... | ..... | (d) | ..... | ..... | (d) | (d) |
| Zinc.....do.... | ..... | ..... | 925 | 99,900 | ..... | ..... | 1,000 | 114,000 |
| Miscellaneous..... | ..... | 1,542,645 | ..... | 855,633 | ..... | 49,403 | ..... | 2,303,647 |
| Total value, eliminating duplications.. | $17,150,742 | | | | $17,902,451 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes stone sold rough.
d From copper smelters. No report for 1910. Value included under "Miscellaneous."

Fifth in importance in Tennessee's mineral production is the output of the quarries, nearly equally divided in value between marble and limestone. Tennessee marbles have a high reputation for interior decoration and approximately 75 per cent of the entire output is sold for that purpose. The limestone is used chiefly for roadmaking, railroad ballast, concrete, and furnace flux. The principal marble-

producing counties are Blount, Hawkins, Knox, Loudoun, and Union, and those producing the larger part of the limestone are Bradley, Campbell, Carter, Cheatham, Coffee, Cumberland, Davidson, Dickson, Franklin, Giles, Hamilton, Hickman, Jefferson, Knox, Marion, Maury, Rhea, Roane, Robertson, Sullivan, Trousdale, and Wilson. The total value of the stone production of Tennessee was $1,455,482 in 1910 and $1,498,798 in 1911.

The chief clay products of Tennessee are common and front brick and pottery. The value of the clay products in 1911 was $1,385,100 against $1,414,288 in 1910. The pottery products had a value of $209,180 in 1910 and of $197,139 in 1911. In addition to these, 61,407 short tons of raw clay, valued at $120,753, in 1910, and 49,653 short tons, valued at $104,277, in 1911 were mined and sold. The leading raw clay product is ball clay, in the production of which Tennessee holds second place. The counties leading in the output of clay products are Hamilton, Davidson, Shelby, and Knox.

Other products are barytes, bauxite, Portland cement, gold, lime, manganese ore, mineral paints, mineral waters, natural gas, silver, zinc, sand, and gravel.

## TEXAS.

Texas, the largest State in area, and the fifth in the number of inhabitants, is twenty-third in the value of its mineral production. It does not hold first place as a producer of any mineral or mineral substance, but ranks second in the production of two—asphalt and quicksilver. Its principal mineral product is petroleum, in which it ranks sixth among the States in quantity of output and seventh in value. The value of the petroleum product represents something more than one-third of the total for the State. In 1910 the production of petroleum was 8,899,266 barrels, valued at $6,605,755, and the total value of all mineral products was $18,404,254. In 1911 the production of petroleum amounted to 9,526,474 barrels, valued at $6,554,552 and the total value of all products was $18,817,304.

Among the older Texas oil fields there was in 1911 an interesting increase at Markham. The other oil fields show the usual slight decline. The feature of the greatest interest in petroleum in Texas was the discovery and development of the Electra pool in Wichita County, on the northern edge of the State. The oil in this field proves to be of an exceptionally fine quality, being almost identical with Pennsylvania oil. There is considerable prospect of extending this pool to the southeast and the southwest, and good indications of oil are found as far east as half way to the next producing region, in Clay County. The latter district has not been as profitable as the new Electra field, but has yielded sufficient gas to supply Wichita Falls, Dallas, and Fort Worth. Much prospecting is going on in the western half of Texas in many different localities, where seepages and other indications show the probability of fine oil supplies.

Second in importance, reckoned by value of the output, is coal, including lignite, the combined production of which was 1,892,176 short tons, valued at $3,160,965, in 1910 and 1,974,593 tons, valued at $3,273,288, in 1911. Texas is the only State in the Union that produces considerable quantities of both true bituminous coal and lignite or brown coal. The areas of true coal are much less in extent than those of the lignites but contribute something over half of the output

and about 80 per cent of the total value. In 1910 the production of bituminous coal was 1,010,944 short tons, valued at $2,397,858, and that of lignite was 881,232 tons, valued at $763,107. In 1911 the production of bituminous coal amounted to 1,083,952 tons, valued at $2,491,361, and that of lignite was 890,641 tons, valued at $781,927. Bituminous coal is produced in six counties—Erath, Palo Pinto, Wise, and Young, in the north central part of the State, and Maverick and Webb on the Mexican border. The lignite areas extend in a broad belt from the Sabine to the Rio Grande, but production is limited at present to 11 counties, of which the principal ones are Milam and Wood.

The following table gives the quantity and value of the mineral products of Texas in 1910 and 1911:

*Mineral production of Texas in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asphalt..short tons.. | ..... | ..... | 57,713 | $1,040,825 | ..... | ..... | 55,826 | $786,785 |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons..... | 1,114 | b $5,786 | ..... | 2,863,930 | 2,070 | b $9,480 | ..... | 2,659,919 |
| Coal .....short tons.. | 1,892,176 | 3,160,965 | ..... | ..... | 1,974,593 | 3,273,288 | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 2,961 | 376 | ..... | ..... | 105 | 13 |
| Fuller's earth, short tons..... | (a) | (a) | ..... | ..... | (a) | (a) | | |
| Gems and precious stones..... | ..... | ..... | ..... | 834 | ..... | ..... | ..... | 2,600 |
| Gold, fine ounces (troy)..... | ..... | ..... | 19 | 400 | ..... | ..... | 189 | 3,900 |
| Gypsum .short tons.. | 188,559 | ..... | ..... | 488,646 | 179,625 | ..... | ..... | 491,685 |
| Iron ore...long tons.. | 29,535 | 34,003 | ..... | ..... | ..... | ..... | ..... | ..... |
| Lead.....short tons.. | ..... | ..... | 33 | 2,904 | ..... | ..... | 57 | 5,130 |
| Lime.....do.... | ..... | ..... | 48,200 | 226,952 | ..... | ..... | 43,064 | 218,007 |
| Mineral waters, gallons sold..... | 1,241,248 | 128,549 | ..... | ..... | 1,637,932 | 158,367 | ..... | ..... |
| Natural gas..... | ..... | (a) | ..... | ..... | ..... | 1,014,945 | ..... | ..... |
| Petroleum...barrels.. | 8,899,266 | 6,605,755 | ..... | ..... | 9,526,474 | 6,554,552 | ..... | ..... |
| Quicksilver...flasks.. | ..... | ..... | 3,320 | 154,413 | ..... | ..... | (a) | (a) |
| Salt.....barrels.. | ..... | ..... | 382,164 | 272,568 | ..... | ..... | 385,200 | 299,537 |
| Sand and gravel, short tons..... | 1,006,584 | 517,225 | ..... | ..... | 1,048,352 | 543,866 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Silver, fine ounces (troy)..... | ..... | ..... | 364,400 | 196,800 | ..... | ..... | 444,200 | 239,900 |
| Stone..... | ..... | 241,152 | ..... | 313,467 | ..... | (c) | ..... | c 588,777 |
| Tin.....short tons.. | ..... | ..... | 3 | 2,587 | ..... | ..... | 5 | 4,226 |
| Miscellaneous..... | ..... | 455,857 | ..... | 1,696,046 | ..... | (c) | ..... | c1,971,807 |
| Total value, eliminating duplications.. | $18,404,254 | | | | $18,817,304 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

The clay products of Texas were valued at $2,659,919 in 1911 against $2,863,930 in 1910. The principal products are common brick, vitrified brick, and front brick, the first constituting about 60 per cent of the total. Pottery products included in these totals were valued at $119,085 in 1910 and at $132,417 in 1911. The principal clay-working counties are Ellis, Bowie, Wilson, Bastrop, and Harris.

The manufacture of Portland cement is of comparatively recent development in Texas, but the production has increased rapidly from

less than 500,000 barrels in 1908 to over 650,000 barrels in 1909, to nearly 1,300,000 barrels in 1910, and to 1,504,511 barrels in 1911. Cement materials are abundantly distributed but present operations are confined to 4 plants, 2 near Dallas, 1 at San Antonio, and 1 at El Paso.

The asphalt production of Texas, which is principally residue from heavy asphaltic oils, amounted to 57,713 short tons, valued at $1,040,825, in 1910, and 55,826 tons, valued at $786,785, in 1911.

The production of quicksilver, in which Texas ranks second among the States, is from Brewster County, in the western part of the State.

The principal quarry product is limestone, produced in Bell, Bexar, Brown, Comal, Coryell, Dallas, El Paso, Grayson, Guadalupe, Jack, Jones, Lampasas, Nolan, Palo Pinto, Polk, Runnels, Travis, and Williamson counties, and is used for building, for foundations, for road making, for concrete, and for flux. Granite is produced in Burnet, El Paso, and Llano counties. The red granite of Burnet County has few equals in attractiveness in this country.

Other mineral products of Texas are fuller's earth, copper, precious stones, gold, lead, lime, mineral waters, natural gas, gypsum, iron ore, pig iron, salt, sand-lime brick, silver, sand and gravel.

## UTAH.

Utah is unique among the States in the diversity of its production of precious and semiprecious metals. It does not rank first in the production of any of these metals, but it stands well among the leaders in the production of gold, silver, copper, lead, zinc, and vanadium minerals. In the production of lead and silver it ranks third; it ranks fourth in the production of copper, sixth in the production of gold, and seventh in the production of zinc. Forty per cent of the total production of the State is from the copper mines, of which the most important producing district is the Bingham, in Salt Lake County. The Tintic district, in Juab County, and the San Francisco district, in Beaver County, are less important copper producers. The quantity of copper produced in 1910 was 125,185,455 pounds, valued at $15,898,553, and in 1911 it was 142,340,215 pounds, valued at $17,792,527. The silver mines are in Juab, Summit, Wasatch, and Utah counties, with smaller quantities from Salt Lake, Beaver, and Tooele counties, and the production was valued at $5,640,800 in 1910 and at $6,280,500 in 1911.

The principal silver-producing counties are also the chief producers of lead, the output of which was 57,081 short tons, valued at $5,023,128, in 1910, and 55,198 short tons, valued at $4,967,820, in 1911. Gold is the fourth in importance among the metal products of the State, and it amounted in 1910 to 208,627 fine ounces, valued at $4,312,700; in 1911 the gold production was 217,020 fine ounces, valued at $4,486,200. The principal producing counties are Juab, Salt Lake, and Tooele; small amounts come from Utah, Summit, Wasatch, Beaver, Boxelder, Morgan, Iron, and Piute, and a small placer production from other counties. About 25 per cent of the gold is obtained from dry or siliceous ores, but most of the output is obtained in the refining of copper. Some of the lead and zinc ores also produce gold.

The zinc production, which is chiefly from middlings and concentrates from the Park City district, amounted in 1910 to 7,221 short

tons, valued at $779,868, and in 1911 to 7,004 short tons, valued at $798,456. The value of the metal production of Utah in 1910 was $31,655,049 out of a total value of all mineral production of $39,233,716; in 1911 the metal production was valued at $34,325,503 out of a total value of $41,139,075. More than one-half of the remainder is obtained from coal mines, which in 1910 produced 2,517,809 short tons, valued at $4,224,556, and in 1911, 2,513,175 short tons, valued at $4,248,666. The principal coal-producing county is Carbon, which contains part of the Uinta coal basin, extending from central Utah nearly through the central part of Colorado. The developments are principally along the line of the Denver & Rio Grande Railroad. Some of the Carbon County coal possesses coking qualities. From 250,000 to 350,000 tons are made into coke annually, chiefly from the slack produced in the coal-mining operations.

The following table gives the quantity and value of the mineral production of Utah during 1910 and 1911:

*Mineral production of Utah in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asphalt..short tons.. | 34,942 | $526,298 | 755 | $43,035 | 30,846 | $516,614 | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | 811,800 | 1,005,960 | ..... | ..... | 662,849 | $827,523 |
| Clay products, short tons..... | 6,209 | [a] 8,903 | ..... | [b] 864,258 | 3,776 | [a] 9,241 | ..... | [b] 548,955 |
| Coal .....short tons.. | 2,517,809 | 4,224,556 | ..... | ..... | 2,513,175 | 4,248,666 | ..... | ..... |
| Coke.....do.... | ..... | ..... | [a] [c] | [a] [c] | ..... | ..... | [a] [c] | [a] [c] |
| Copper.....pounds.. | ..... | ..... | 125,185,455 | 15,898,553 | ..... | ..... | 142,340,215 | 17,792,527 |
| Gems and precious stones..... | ..... | ..... | ..... | 13,200 | ..... | ..... | ..... | 4,625 |
| Gold, fine ounces (troy)..... | ..... | ..... | 208,627 | 4,312,700 | ..... | ..... | 217,020 | 4,486,200 |
| Gypsum .short tons.. | [c] | ..... | ..... | [c] | [c] | ..... | ..... | [c] |
| Lead.....do.... | ..... | ..... | 57,081 | 5,023,128 | ..... | ..... | 55,198 | 4,967,820 |
| Lime.....do.... | ..... | ..... | 15,625 | 88,030 | ..... | ..... | 11,681 | 74,770 |
| Mineral waters, gallons sold..... | [c] | [c] | ..... | ..... | [c] | [c] | ..... | ..... |
| Petroleum...barrels.. | [c] | [c] | ..... | ..... | [c] | [c] | ..... | ..... |
| Phosphate rock, long tons..... | [c] | [c] | ..... | ..... | [c] | [c] | ..... | ..... |
| Salt.....barrels.. | 44,771 | 13,804 | 205,079 | 172,065 | 36,242 | 14,244 | 236,178 | 157,024 |
| Sand and gravel, short tons..... | 183,494 | 21,354 | ..... | ..... | 144,857 | 25,889 | ..... | ..... |
| Scythestones..... | ..... | ..... | ..... | [c] | ..... | ..... | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 10,445,900 | 5,640,800 | ..... | ..... | 11,630,600 | 6,280,500 |
| Stone..... | ..... | [d] | ..... | [d] 440,775 | ..... | [d] | ..... | [d] 215,657 |
| Sulphur...long tons.. | [c] | [c] | ..... | ..... | [c] | [c] | ..... | ..... |
| Uranium and vanadium ores, short tons..... | ..... | ..... | ..... | ..... | ..... | ..... | [c] | [c] |
| Zinc.....short tons.. | ..... | ..... | 7,221 | 779,868 | ..... | ..... | 7,004 | 798,456 |
| Miscellaneous..... | ..... | 22,542 | ..... | 732,842 | ..... | 43,311 | ..... | 1,113,193 |
| Total value, eliminating duplications..... | $39,233,716 | | | | $41,139,075 | | | |

[a] Value not included in total value.
[b] Exclusive of pottery, which is included under "Miscellaneous."
[c] Value included under "Miscellaneous."
[d] Derived product includes stone sold rough.

The manufacture of Portland cement began in Utah in 1910, with an output of 811,800 barrels, valued at $1,005,960. The industry

appears to have been overdone in the first year, for the production dropped in 1911 to 662,849 barrels, valued at $827,523.

Clay products of the State consist chiefly of common brick and front brick, with smaller amounts of vitrified brick, drain and other tile, and a small output of pottery. The value of the clay products decreased, exclusive of pottery, from $864,258 in 1910 to $548,955 in 1911. The principal stone quarried in Utah is limestone, the larger part of which is used for flux in the smelters, although some is used for foundation work and also for building purposes. The limestone quarries are located principally in Cache, Morgan, Salt Lake, San Juan, San Pete, Tooele, and Utah counties. Utah produces also sandstone and granite. Other mineral products are asphalt, precious stones, lime, salt (gathered on the shores of the Great Salt Lake), arsenic, bismuth, graphite, gypsum, mineral waters, petroleum, phosphate rock, pottery, sulphur, vanadium minerals, sand, and gravel.

## VERMONT.

Vermont's principal claim to distinction as a mining State is in the output of its marble, granite, and slate quarries. Vermont is the leading State in the production of both marble and granite, and second in the production of slate. The marble quarries are chiefly in Rutland County in the west-central part of the State and in the immediate vicinity of Rutland and Proctor, with smaller quantities in Franklin County in the northwestern part and Bennington County in the southwestern part of the State. The granite quarries are along the eastern borders, the principal producing counties being Washington and Orange, lying almost due northeast from the marble-producing region. The slate production is almost exclusively from Rutland County. The total production of stone in Vermont in 1910 was valued at $6,282,574, of which $3,562,850 was marble and $2,694,474 was granite. Limestone to the value of $25,250 was produced. The slate production was valued at $1,894,659—a total value for all quarry products of $8,177,233. In 1911 the marble production was valued at $3,394,930, the granite at $2,730,719, the limestone at $19,702, and the slate at $1,624,941—the total value for all quarry products being $7,770,292. The total value of all mineral products of Vermont was $8,720,409 in 1910, and $8,434,516 in 1911, so that the quarries are responsible for over 90 per cent of the State's total production. If to these the value of the scythestones and soapstone be added the quarry products represent 97 per cent of the total value of the State's mineral output. The lime production in 1910 was 38,667 short tons, valued at $203,606, and in 1911 it was 37,333 tons, valued at $191,035. The production of soapstone, including talc, was 25,975 short tons in 1910, valued at $136,674; and 29,488 short tons, valued at $200,015 for 1911. Considerable development of asbestos properties has been in progress in Vermont in the last few years, and this promises to be an important industry in the State. The other less important productions are copper, mineral paints, clay products, mineral waters, sand, and gravel.

The following table gives the quantity and value of the mineral production of Vermont during 1910 and 1911:

*Mineral production of Vermont in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asbestos .short tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Clay produets.do.... | 6,060 | b $34,038 | ..... | $89,253 | (a) (b) | (a) (b) | ..... | $86,466 |
| Copper.....pounds.. | ..... | ..... | 1,935 | 246 | ..... | ..... | ..... | ..... |
| Lime.....short tons.. | ..... | ..... | 38,667 | 203,606 | ..... | ..... | 37,333 | 191,035 |
| Mineral paints, natural pigments, short tons..... | ..... | ..... | 609 | 5,935 | ..... | ..... | 504 | 5,047 |
| Mineral waters, gallons sold..... | 137,875 | 16,660 | ..... | ..... | 25,200 | $9,346 | ..... | ..... |
| Scythestones..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Sand and gravel, short tons..... | 66,418 | 19,047 | ..... | ..... | 104,852 | 52,540 | ..... | ..... |
| Slate..... | ..... | ..... | ..... | 1,894,659 | ..... | ..... | ..... | 1,624,941 |
| Stone..... | ..... | 2,036,369 | ..... | 4,246,205 | ..... | (c) | ..... | c6,145,351 |
| Talc and soapstone, short tons..... | (c) | (c) | c 25,975 | c 136,674 | (c) | (c) | c 29,488 | c 200,015 |
| Miscellaneous..... | ..... | (c) | ..... | c 71,755 | ..... | (c) | ..... | c 164,672 |
| Total value, eliminating duplications ... | $8,720,409 | | | | $8,434,516 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

## VIRGINIA.

Exclusive of the production of pig iron and inclusive of the value of iron ore produced, the total value of the mineral production of Virginia in 1910 was $13,898,516 and in 1911 it was $13,609,364. The principal production included in this total was coal, the output of which in 1910 was 6,507,997 short tons, valued at $5,877,486, and in 1911 was 6,864,667 short tons, valued at $6,254,804. Virginia is credited with having produced the first coal mined in the United States from a small basin contained in Henrico and Chesterfield counties in the eastern part of the State, near Richmond. Coal was known to exist in this locality as early as 1710, and before the close of the century shipments were made from this region to some of the Northern States. With the development of the more abundant and higher grade of coals of the Appalachian region, the industry in the eastern part of the State lagged and for a number of years the mines were not in operation. They were reopened in 1910 and in 1911 were again at a producing stage. The chief production of coal, however, is in Wise, Tazewell, Lee, and Russell counties in the southwestern portion of the State, the area of which belongs to the Appalachian system. The mining of coal in southwestern Virginia was coincident with the first Survey report on the mineral resources of the United States. The first shipment from the Pocahontas district in Tazewell County was made to Norfolk in 1883. In 1888 the production of this region had exceeded 1,000,000 tons. In 1892 the Wise County fields were opened, and in 1897 the production from this new

district exceeded that of Tazewell County. The mines in Lee County were opened in 1905, and development of properties in Russell County have been active during the last two or three years. The output of 1911 was the largest ever obtained.

The production of pig iron in Virginia, the value of which is not included in the total, amounted in 1910 to 402,625 long tons, valued at $5,576,599, decreasing in 1911 to 308,789 long tons, valued at $3,898,285. Most of the blast furnaces are located in the southwestern part of the State, convenient to the iron ores and fuels. The iron-ore production of Virginia, most of which is brown ore, amounted to 903,377 long tons, valued at $1,845,144, in 1910, and to 610,871 long tons, valued at $1,146,188, in 1911. It is produced principally in Botetourt, Allegheny, Pulaski, and Wythe counties, and the larger part is used in the furnaces of the companies operating the mines.

Most of the coals mined in the southwestern part of Virginia possess coking qualities, although 2 banks of ovens, 1 at Low Moor and 1 at Covington, are supplied with coal from the New River district in West Virginia. The total production of coke in Virginia in 1910 was 1,493,655 short tons, valued at $2,731,348, and in 1911, in sympathy with the decrease in the production of iron ore and the manufacture of pig iron, it was 910,411 short tons, valued at $1,615,609.

The value of the clay products of Virginia in 1911 were valued at $1,739,900 against $1,839,687 in 1910. Common brick represents 80 per cent of the total value, and about 18 per cent is represented by the value of front brick. A smaller quantity of ornamental and fire brick and tile is also produced. The value of the output of the stone quarries was $1,000,089 in 1910 and $821,798 in 1911, the principal stones produced being granite and limestones. The principal granite operations are in the vicinity of Richmond in Henrico County. The granite of this area has a high reputation as a building stone. A large portion of the production is crushed for use in roadmaking, railroad ballast, and concrete. Considerable quantities of limestone are also used for these purposes, but the larger portion of the output is consumed as flux in the iron furnaces. Virginia is the leading State in the production of manganese ore and of pyrite and is the only producer of rutile. Virginia stands first in the production of soapstone, most of which is manufactured into various heat-resisting articles, such as hearthstones, mantels, griddles, sinks, etc., before being marketed. The quarries are located in the soapstone belt, which has its greatest development in Albemarle and Nelson counties. The production in 1910 amounted to 25,908 short tons, valued in the condition in which first sold at $510,781, and in 1911 the production was 26,759 short tons, valued at $660,926. The production of lime, which might also be included in the output of the stone quarries, was 141,257 short tons, valued at $563,567, in 1910 and 132,133 short tons, valued at $483,016, in 1911.

Other products of less importance are barytes, copper, cement, feldspar, precious stones (occasionally), gypsum, lead, mica, millstones (in which Virginia ranks second), mineral paints, mineral waters, salt, sand-lime brick, gold, silver, slate, zinc, sand, and gravel.

The following table gives the mineral production of Virginia during 1910 and 1911:

*Mineral production of Virginia in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asbestos.short tons.. | ..... | ..... | ..... | ..... | (a) | (a) | ..... | ..... |
| Barytes.....do.... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons..... | 530 | b $1,486 | ..... | $1,839,687 | 10,666 | b $3,087 | ..... | $1,739,900 |
| Coal.....short tons.. | 6,507,997 | 5,877,486 | ..... | ..... | 6,864,667 | 6,254,804 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 1,493,655 | b2,731,348 | ..... | ..... | 910,411 | b1,615,609 |
| Copper.....pounds.. | ..... | ..... | 105,313 | 13,375 | ..... | ..... | ..... | ..... |
| Feldspar.short tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Ferro-alloys, long tons | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Gold, fine ounces (troy)..... | ..... | ..... | 44 | 900 | ..... | ..... | 150 | 3,100 |
| Gypsum.short tons.. | (a) | ..... | ..... | (a) | (a) | ..... | ..... | (a) |
| Infusorial earth..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Iron ore...long tons.. | 903,377 | 1,845,144 | ..... | ..... | 610,871 | 1,146,188 | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | 402,625 | b5,576,599 | ..... | ..... | 308,789 | b3,898,285 |
| Lead.....short tons.. | ..... | ..... | 87 | 7,656 | ..... | ..... | 400 | 36,000 |
| Lime.....do.... | ..... | ..... | 141,257 | 563,567 | ..... | ..... | 132,133 | 483,016 |
| Manganese ore and manganiferous ore, long tons..... | 2,059 | 18,509 | ..... | ..... | 2,962 | 25,770 | ..... | ..... |
| Mica..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (a) |
| Millstones..... | ..... | ..... | ..... | 5,273 | ..... | ..... | ..... | 17,635 |
| Mineral paints, natural pigments, short tons..... | ..... | ..... | ..... | ..... | ..... | ..... | (a) | (a) |
| Mineral waters, gallons sold..... | 2,441,923 | 301,523 | ..... | ..... | 2,474,918 | 298,701 | ..... | ..... |
| Pyrite....long tons.. | (a) | (a) | ..... | ..... | 150,800 | 558,494 | ..... | ..... |
| Rutile ...short tons.. | ..... | ..... | 566 | 44,480 | ..... | ..... | ..... | ..... |
| Salt.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Sand and gravel, short tons..... | 764,321 | 215,416 | ..... | ..... | 553,996 | 204,170 | ..... | ..... |
| Sand-lime brick..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 200 | 100 | ..... | ..... | 200 | 100 |
| Slate..... | ..... | ..... | ..... | 148,721 | ..... | ..... | ..... | 188,808 |
| Stone..... | ..... | 386,354 | ..... | 613,735 | ..... | (c) | ..... | c821,798 |
| Talc and soapstone, short tons..... | (c) | (c) | c25,908 | c510,781 | (c) | (c) | c26,759 | c660,926 |
| Zinc.....short tons.. | ..... | ..... | 1,168 | 126,144 | ..... | ..... | 228 | 25,992 |
| Miscellaneous..... | ..... | 536,677 | ..... | 891,988 | ..... | 14,688 | ..... | 1,171,274 |
| Total value, eliminating duplications. | $13,898,516 | | | | $13,609,364 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

## WASHINGTON.

Washington is the only State on the Pacific coasts in which coal is the chief product, and it is also the only one of the three Pacific coast States in which coal mining is an industry of any importance. In 1910 out of the total production, valued at $16,693,030, that of the coal output represented $9,764,465, or approximately 60 per cent. In 1911, out of a total value for the State of $15,853,556, the coal output was valued at $8,174,170, or 51.6 per cent. The smaller production of coal in 1911, it having decreased from 3,911,899 short tons in 1910, to 3,572,815 short tons, was due to the competition of

fuel oil from California. The advantages of fuel oil are so marked, particularly as a sparkless fuel in the heavily forested State of Washington, that transportation companies having their own coal mines are using oil in their locomotives from Portland and Puget Sound through and beyond the forested areas. The maximum of production of coal in Washington was that attained in 1910. Coal mining began in Washington as early as in 1860, when the United States Census reported an output of 5,374 short tons. In 1882, the first of the thirty years of which Mineral Resources has kept record, the production had increased to 177,340 tons. Before the end of that decade, however, in 1888, active exploitation of the coal areas of Washington began, and the output had exceeded 1,200,000 tons. It passed the 2,000,000-ton mark in 1899, and four years later exceeded 3,000,000 tons. It would probably have passed the 4,000,000-ton mark in 1911 except for the competition of fuel oil. With the exception of a small area, known as the Roslyn field on the eastern edge of the Cascade Mountains in Kittitas County, the principal coal fields of Washington are in close proximity to Puget Sound, Seattle and Tacoma obtaining their fuel supply from mines less than 50 miles distant. The principal producing counties are King, Kittitas, and Pierce. Some of the Pierce County coal makes a fair grade of coke, and ovens located at Fairfax and Wilkeson make coke from the slack coal produced in the mining operations. All the coal is washed before coking, and most of the coke is sold to the smelter at Tacoma; smaller quantities going to Portland and Seattle for foundry use.

Next to coal the chief mining industry in Washington is clay working, of which the principal products are sewer pipe, common brick, asbestos, terra cotta, fireproofing, in the order named. Washington is one of only two States in which the manufacture of sewer pipe constitutes the most important of the clay products. The clay-working industries in 1910 produced wares to the value of $3,023,854 and in 1911, $2,840,372. The principal producing counties are King, Spokane, and Stevens.

The principal stone products of Washington are granite and sandstone, with smaller amounts of marble and limestone. Unlike coal mining and clay working the quarry industry in Washington showed an increase in 1911 over 1910. The total value of the stone production increased from $1,118,059 in 1910 to $1,679,872 in 1911. The granite, most of which is produced in Clarke, Cowlitz, King, Lewis, Pierce, Snohomish, Spokane, and Yakima counties, increased from $642,992 in 1910 to $1,345,551 in 1911. The limestone, produced chiefly in San Juan and Snohomish counties, decreased from $438,538 in 1910 to $32,478 in 1911. Washington produces small quantities of gold and silver. In 1910 the gold production amounted to 38,990 fine ounces, valued at $806,000, and the silver to 204,900 fine ounces, valued at $110,600. In 1911 the production of gold was 40,635 fine ounces, valued at $840,000 and that of silver was 230,300 ounces, valued at $124,400. The digging of gravel for concrete and railroad ballast is an industry of some importance. The principal production of sand is for building. The total production of sand and gravel amounted to 1,575,289 short tons, valued at $481,569, in 1910, and to 1,145,369 short tons, valued at $338,400, in 1911. Tungsten

ore to the value of $51,768 was produced in 1910. Other substances produced are arsenic, cement, copper, mineral paints, precious stones (occasionally), lead, lime, sand-lime brick, mineral waters, pig iron, zinc-lead, and zinc pigment.

The following table gives the quantity and value of the mineral production of Washington in 1910 and 1911:

*Mineral production of Washington in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Cement.....barrels | ..... | ..... | (c) | (c) | ..... | ..... | 960,573 | $1,496,807 |
| Clay products, short tons | 3,851 | b $7,132 | ..... | d$3,023,854 | 1,187 | b$2,753 | ..... | d2,840,372 |
| Coal .....short tons | 3,911,899 | 9,764,465 | ..... | ..... | 3,572,815 | 8,174,170 | ..... | ..... |
| Coke.....do | ..... | ..... | 59,337 | b 347,540 | ..... | ..... | 40,180 | b 216,262 |
| Copper.....pounds | ..... | ..... | 65,021 | 8,258 | ..... | ..... | 195,503 | 24,438 |
| Gold, fine ounces, (troy) | ..... | ..... | 38,990 | 806,000 | ..... | ..... | 40,635 | 840,000 |
| Gypsum,e short tons | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Iron ore...long tons | (c) | (c) | ..... | ..... | ..... | ..... | ..... | ..... |
| Iron, pig.....do | ..... | ..... | (b) (c) | (b) (c) | ..... | ..... | ..... | ..... |
| Lead.....short tons | ..... | ..... | 311 | 27,368 | ..... | ..... | 601 | 54,090 |
| Lime.....do | ..... | ..... | 35,540 | 267,735 | ..... | ..... | 35,094 | 228,933 |
| Mineral paints, natural pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Zinc-lead pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | ..... | ..... |
| Mineral waters, gallons sold | 31,200 | 12,571 | ..... | ..... | 148,800 | 14,654 | ..... | ..... |
| Sand and gravel, short tons | 1,575,289 | 481,569 | ..... | ..... | 1,145,369 | 338,400 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | (c) | ..... | ..... | ..... | (c) |
| Silver, fine ounces, (troy) | ..... | ..... | 204,900 | 110,600 | ..... | ..... | 230,300 | 124,400 |
| Stone | ..... | (f) | ..... | f 1,118,059 | ..... | (f) | ..... | f1,679,872 |
| Tungsten ore (60 per cent concentrates) short tons | ..... | ..... | 103 | 51,768 | ..... | ..... | (c) | (c) |
| Zinc .....short tons | ..... | ..... | ..... | ..... | ..... | ..... | 12 | 1,368 |
| Miscellaneous | ..... | (f) | ..... | f 1,148,561 | ..... | ..... | ..... | 75,052 |
| Total value eliminating duplications | $16,693,030 | | | | $15,853,556 | | | |

a No report for 1910.
b Value not included in total value.
c Value included under "Miscellaneous."
d Exclusion of pottery, which is included under "Miscellaneous."
e No gypsum mined. Alaskan gypsum calcined in Washington.
f Derived product includes raw product.

## WEST VIRGINIA.

West Virginia bases its claim to distinction in the mining industry as a producer of solid, liquid, and gaseous fuels. In the production of coal West Virginia ranks second in quantity and third in value of its output; in the production of petroleum it ranks fourth; and in the production of natural gas it stands at the head of all the States. These three fuels represent 90 per cent of the total mineral production as expressed in values. Coal alone constitutes over 50 per cent, natural gas over 20 per cent, and petroleum over 15 per cent. In

the total value of its mineral production West Virginia ranked second in 1910, with $102,477,594, and third, with $101,948,248, in 1911, and though more than 90 per cent of its total mineral production is represented by its fuels, it ranks thirty-fourth in the value of its manufactures. Not more than 20 per cent of the coal, petroleum, and natural gas produced in West Virginia is consumed for useful purposes within the State. The principal consumption of coal in West Virginia is by the locomotives hauling the trains, carrying the coal and the coke outside of the State's borders. With the largest supply of coking coal in the United States and ranking second in the quantity of coke produced, West Virginia manufactured only 222,135 long tons of pig iron in 1910 and 287,472 tons in 1911. The production of coke in West Virginia was 3,803,850 short tons, valued at $7,354,059, in 1910, and 2,291,049 short tons, valued at $4,236,845, in 1911. This does not, however, represent by any means the total quantity of coke made from West Virginia coal, as ovens at Low Moor and Covington in Virginia, at Indianapolis and Gary in Indiana, at Chicago and Joliet in Illinois, and at Hamilton and Cleveland in Ohio, draw their supplies of coal from the West Virginia mines. In the 30 years during which the volumes of Mineral Resources have been published, the coal production of West Virginia has increased nearly thirtyfold. In 1882 the production of the State was estimated at 2,240,000 short tons, which was probably slightly in excess of the actual production, as in 1881 it had amounted to 1,680,000 short tons. In 1910, the year of the maximum output, the production amounted to 61,671,019 short tons, valued at $56,665,061. In 1911 the production of coal amounted to 59,831,580 short tons, valued at $53,670,515. The principal producing counties are Fayette, Kanawha, Logan, McDowell, Mercer, Putnam, and Mingo, in the southern part of the State, and Barbour, Harrison, Marion, Mineral, Preston, Taylor, and Tucker, in the northern part of the State. Coal is produced in 35 out of 55 counties in the State.

The petroleum production, which amounted to 11,753,071 barrels valued at $15,723,544 in 1910 and to 9,795,464 barrels valued at $12,767,293 in 1911, is principally from Ritchie, Pleasants, Tyler, Wetzel, and Harrison counties. It is impossible to make a county distribution of the production of natural gas.

Next to fuels, the clay products are the most important, and of these the value of the pottery represents two-thirds of the total. West Virginia is third among the States in the value of pottery products, being exceeded only by Ohio and New Jersey. Of the other clay products, vitrified brick is the most important, followed by common brick, tile, and fire brick. The first trial in the United States of vitrified brick as a paving material was made in Charleston, W. Va. The total value of the clay products was $3,998,045 in 1910, of which $2,675,588 was the value of the pottery. In 1911 the total value of the clay products was $4,333,420, of which the pottery products constituted $2,880,202. The principal quarry products are limestone and sandstone, the latter predominating in proportion of about four to one. The northern part of the Shenandoah Valley is particularly rich in limestone suitable for iron-furnace flux, and approximately 70 per cent of the limestone produced in the State is for this purpose. The remainder is chiefly crushed stone used for railroad ballast, roadmaking, and concrete; a little is also used for

building. The value of the quarry products was $1,106,012 in 1911, against $1,054,192 in 1910. The sand and gravel production of West Virginia amounted to 745,241 short tons, valued at $474,461, in 1910, and to 749,391 short tons, valued at $532,388, in 1911, about 60 per cent of the value being in the output of glass sand, in which West Virginia ranks next to Pennsylvania.

Other less important products of the State are bromine, calcium chloride, cement, grindstones, iron ore, lime, mineral waters, and salt.

The following table gives the quantity and value of the mineral production of West Virginia during 1910 and 1911:

*Mineral production of West Virginia in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Bromine....pounds.. | ..... | ..... | (a) | (a) | ..... | ..... | 77,908 | $12,322 |
| Calcium chloride, short tons..... | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Cement.....barrels.. | ..... | ..... | (a) | (a) | ..... | ..... | (a) | (a) |
| Clay products, short tons..... | 69,630 | b $51,543 | ..... | $3,998,045 | 73,304 | b $48,576 | ..... | 4,333,420 |
| Coal.....short tons.. | 61,671,019 | 56,665,061 | ..... | ..... | 59,831,580 | 53,670,515 | ..... | ..... |
| Coke.....do.... | ..... | ..... | 3,803,850 | b7,354,039 | ..... | ..... | 2,291,049 | b4,236,845 |
| Grindstones..... | ..... | ..... | ..... | (a) | ..... | ..... | ..... | (a) |
| Iron ore...long tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Iron, pig.....do.... | ..... | ..... | (a) (b) | (a) (b) | ..... | ..... | (a) (b) | (a) (b) |
| Lime.....short tons.. | ..... | ..... | 90,419 | 274,205 | ..... | ..... | 179,966 | 536,660 |
| Mineral waters, gallons sold..... | 336,444 | 81,742 | ..... | ..... | 259,686 | 67,687 | ..... | ..... |
| Natural gas..... | ..... | 23,816,553 | ..... | ..... | ..... | 28,451,907 | ..... | ..... |
| Petroleum...barrels.. | 11,753,071 | 15,723,544 | ..... | ..... | 9,795,464 | 12,767,293 | ..... | ..... |
| Salt.....do.... | ..... | ..... | 155,625 | 62,955 | ..... | ..... | 183,379 | 78,805 |
| Sand and gravel .....short tons.. | 745,241 | 474,461 | ..... | ..... | 749,391 | 532,388 | ..... | ..... |
| Stone..... | ..... | (c) | ..... | c1,054,192 | ..... | (c) | ..... | c1,106,012 |
| Miscellaneous..... | ..... | (c) | ..... | c3,658,961 | ..... | (c) | ..... | c4,415,847 |
| Total value, eliminating duplications.. | $102,477,594 | | | | $101,948,248 | | | |

a Value included under "Miscellaneous."
b Value not included in total value.
c Derived product includes raw product.

## WISCONSIN.

The product in which Wisconsin leads all other States is mineral waters. The output of mineral waters in Wisconsin is chiefly from the Waukesha Springs in Waukesha County, the value of which exceeds that of the output from the Saratoga Springs in New York. The value of the mineral waters produced in Wisconsin in 1910 was $974,366, decreasing to $955,988 in 1911, whereas the value of the waters sold in New York was $858,635 in 1910 and $939,003 in 1911. Although Wisconsin leads in the value of mineral waters, the most important mineral product of the State is iron ore. Wisconsin is included in the Lake Superior iron-ore district, portions of the Menominee and Gogebic ranges extending from Michigan into Wisconsin. Wisconsin is, however, much behind Minnesota and Michigan in the quantity of iron ore produced, only about 2 per cent of the total production of the Lake Superior region being credited to Wisconsin. The production in Wisconsin in 1911 was a little less than one-half what it was in 1910, the figures being 1,149,551 long tons, valued at

$3,610,349, in 1910, and 559,763 long tons, valued at $1,386,616, in 1911.

Wisconsin is the third State in the Union in the production of lime and fourth in the production of zinc and pyrite. The zinc production of Wisconsin in 1910 was 19,752 short tons, valued at $2,133,216, and in 1911 it was 31,809 short tons, valued at $3,626,226. The lime production was 248,238 short tons, valued at $959,405, in 1910, and 250,638 short tons, valued at $961,558, in 1911. The principal quarry products are granite and limestone. The former, quarried chiefly in Douglas, Green Lake, Marathon, Marquette, Marinette, Waupaca, and Waushara counties, was valued at $475,342 in 1910 and at $1,382,309 in 1911. Limestone, valued at $979,522 in 1910 and at $848,363 in 1911, is quarried in Brown, Buffalo, Dane, Dodge, Door, Fond du Lac, Grant, Green Lake, Iowa, Kewaunee, La Crosse, Marathon, Milwaukee, Outagamie, Ozaukee, Racine, Sheboygan, Vernon, Walworth, Waukesha, and Winnebago counties. The other products are clay, graphite, gypsum, lead, mineral paints, pig iron, quartz, sand-lime brick, sand and gravel, and zinc oxide. The total value of the mineral production of Wisconsin was $12,451,436 in 1911, against $13,084,021 in 1910.

The following table gives the quantity and value of the mineral production of Wisconsin by substances during 1910 and 1911:

*Mineral production of Wisconsin in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Briquets, fuel, short tons | ..... | ..... | (a) | (a) | ..... | ..... | (b) (c) | (b) (c) |
| Clay products, short tons | 359 | b $518 | ..... | $1,176,883 | 586 | b $1,222 | ..... | $1,158,139 |
| Coke.....short tons | ..... | ..... | (b) (c) | (b) (c) | ..... | ..... | (b) (c) | (b) (c) |
| Graphite, amorphous, short tons | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Gypsum .short tons | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (d) |
| Iron ore...long tons | 1,149,551 | 3,610,349 | ..... | ..... | 559,763 | 1,386,616 | ..... | ..... |
| Iron, pig.....do | ..... | ..... | 278,232 | b4,386,859 | ..... | ..... | 245,152 | b3,803,049 |
| Lead.....short tons | ..... | ..... | 3,884 | 341,792 | ..... | ..... | 3,967 | 357,030 |
| Lime.....do | ..... | ..... | 248,238 | 959,405 | ..... | ..... | 250,638 | 961,558 |
| Manganiferous ore, long tons | (e) | (e) | ..... | ..... | (e) | (e) | ..... | ..... |
| Mineral paints, natural pigments, short tons | ..... | ..... | 2,057 | 14,916 | ..... | ..... | 2,048 | 11,258 |
| Zinc-lead pigments, short tons | ..... | ..... | (c) | (c) | ..... | ..... | (c) | (c) |
| Mineral waters, gallons sold | 6,400,812 | 974,366 | ..... | ..... | 5,716,162 | 955,988 | ..... | ..... |
| Pyrite....long tons | 12,555 | 49,467 | ..... | ..... | 12,893 | 50,025 | ..... | ..... |
| Quartz...short tons | (c) | (c) | ..... | ..... | (c) | (c) | ..... | ..... |
| Sand and gravel, short tons | 1,451,758 | 425,563 | ..... | ..... | 3,676,855 | 731,692 | ..... | ..... |
| Sand-lime brick | ..... | ..... | ..... | 29,399 | ..... | ..... | ..... | 68,312 |
| Stone | ..... | 375,486 | ..... | 2,269,032 | ..... | (f) | ..... | f2,375,102 |
| Zinc.....short tons | ..... | ..... | 19,752 | 2,133,216 | ..... | ..... | 31,809 | 3,626,226 |
| Miscellaneous | ..... | (f) | ..... | f3,121,629 | ..... | 30,418 | ..... | 3,118,746 |
| Total value, eliminating duplications | $13,084,021 | | | | $12,451,436 | | | |

a No report for 1910.
b Value not included in total value.
c Value included under "Miscellaneous."
d Not mined, but calcined in Wisconsin. Value included under "Miscellaneous."
e Tonnage and value included in iron ore.
f Derived product includes raw product.

## WYOMING.

The only mineral product of much importance in Wyoming is coal, the value of which represents over 90 per cent of the total mineral production. The principal coal-mining operations are at Rock Springs and Sweetwater in Sweetwater County, Cheyenne and Kemmerer in Uinta County, Sheridan, Monarch, and Dietz in Sheridan County, Rawlins in Carbon County, and Gebo in Bighorn County. Other coal-producing counties are Converse, Crook, Fremont, Johnson, Park, and Weston. The total value of all mineral production in Wyoming in 1910 was $12,766,915, of which the coal production, 7,533,088 short tons, represented in value $11,706,187. In 1911 the coal production amounted to 6,744,864 short tons, valued at $10,508,863, and the total mineral production was valued at $11,486,982.

Wyoming, unlike most of the Rocky Mountain States, is not an important producer of any of the metals, the total value of the copper, gold, and silver production in the State being less than $50,000, and the value of all mineral products outside of coal being about $1,000,000. The mineral products which contribute to this are asbestos, clay manufactures, copper, gold, gypsum, iron ore, mineral waters, lime, natural gas, petroleum, phosphate rock, silver, sulphur, sand, and gravel. The development of the extensive phosphate deposits in the southwestern part of the State gives promise of establishing an important industry in the future.

The following table gives the quantity and value of the mineral production of Wyoming during 1910 and 1911:

*Mineral production of Wyoming in 1910 and 1911.*

| Product. | 1910 | | | | 1911 | | | |
|---|---|---|---|---|---|---|---|---|
| | Raw. | | Derived. | | Raw. | | Derived. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| Asbestos..short tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Clay produets..do.... | 532 | b $1,392 | ..... | $50,237 | (a) (b) | (a) (b) | ..... | $77,146 |
| Coal.....do.... | 7,533,088 | 11,706,187 | ..... | ..... | 6,744,864 | $10,508,863 | ..... | ..... |
| Copper.....pounds.. | ..... | ..... | 217,127 | 27,575 | ..... | ..... | 130,499 | 16,312 |
| Gems and precious stones..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 30 |
| Gold, fine ounces (troy)..... | ..... | ..... | 198 | 4,100 | ..... | ..... | 1,030 | 21,300 |
| Gypsum..short tons.. | 57,163 | ..... | ..... | 150,181 | 44,687 | ..... | ..... | 116,238 |
| Iron ore...long tons.. | 656,629 | 656,629 | ..... | ..... | 479,922 | 479,922 | ..... | ..... |
| Lime.....short tons.. | ..... | ..... | 143 | 1,783 | ..... | ..... | (a) | (a) |
| Mineral waters, gallons sold..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Natural gas..... | ..... | (a) | ..... | ..... | ..... | (a) | ..... | ..... |
| Petroleum...barrels.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Phosphate rock, long tons..... | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Sand and gravel, short tons..... | ..... | ..... | ..... | ..... | 784,865 | 58,548 | ..... | ..... |
| Silver, fine ounces (troy)..... | ..... | ..... | 1,300 | 700 | ..... | ..... | 700 | 400 |
| Stone..... | ..... | 24,174 | ..... | 24,827 | ..... | (c) | ..... | c 40,544 |
| Sulphur...long tons.. | (a) | (a) | ..... | ..... | (a) | (a) | ..... | ..... |
| Miseellaneous..... | ..... | 120,522 | ..... | ..... | ..... | d 168,379 | ..... | (d) |
| Total value, eliminating duplieations.. | | $12,766,915 | | | | $11,486,982 | | |

a Value included under "Miseellaneous."
b Value not included in total value.
c Derived product ineludes stone sold rough.
d Derived product included in raw product.

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